THE JOURNAL OF

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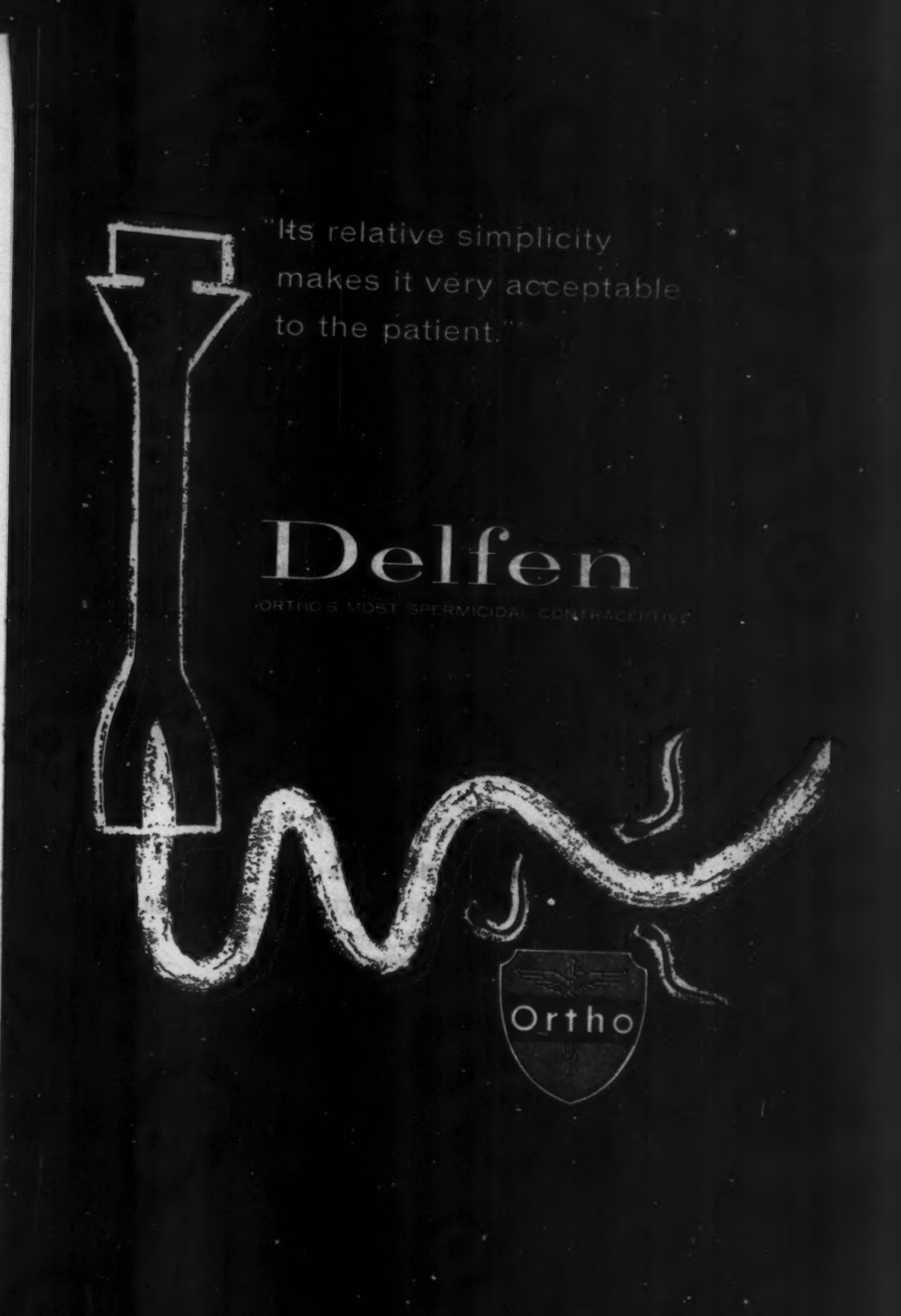
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AMERICAN FEDERATION for CLINICAL RESEARCH Chalfonte-Haddon Hall, Atlantic City, N. J., May 4. Dr. William W. Stead, VA Hospital, Minneapolis 17, Secretary.

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AMERICAN OPHTHALMOLOGICAL SOCIETY, The Greenbrier, White Sulphur Springs, W.Va., May 28-30. Dr. Maynard C. Wheeler, 30 W. 59th St., New York 19, Secretary.

AMERICAN ORTHOPSYCHIATRIC ASSOCIATION, Shoreham Hotel, Washington D.C., May 11-16. Dr. Harold A. Sofield, 715 Lake St., Oak Park, Ill., Secretary.

AMERICAN OTOLOGICAL SOCIETY, Hotel Fairmont, San Francisco, May 17-18. Dr. Lawrence R. Boies, Univ. Hosp., Minneapolis 14, Secretary.

AMERICAN PEDIATRIC SOCIETY, Hotel Traymore, Atlantic City, N.J., May 8-9. Dr. A. C. McGuinness, 2000 Quebec St., Washington 8, D.C., Secretary.

AMERICAN PSYCHIATRIC ASSOCIATION, Civic Auditorium, San Francisco, May 12-16. Dr. William Malamud, 80 E. Concord St., Boston 18, Secretary.

AMERICAN PSYCHOANALYTIC ASSOCIATION, Hotel Fairmont, San Francisco, May 9-11. Dr. Lewis L. Robbins, 36 W. 44th St., New York, Secretary.

AMERICAN SOCIETY FOR CLINICAL INVESTIGATION, Haddon Hall, Atlantic City, N.J., May 5. Dr. S. J. Farber, 880 First Ave., New York 16, Secretary.

AMERICAN THORACIC SOCIETY, Convention Hall, Philadelphia, May 19-23. Dr. E. P. K. Fenger, 1790 Broadway, New York 19, Secretary.

ASSOCIATION OF AMERICAN PHYSICIANS, Haddon Hall, Atlantic City, N.J., May 6-7. Dr. Paul B. Beeson, Yale Univ. School of Med., New Haven 11, Conn., Secretary.

NATIONAL TUBERCULOSIS ASSOCIATION, Bellevue-Stratford Hotel, Philadelphia, May 18-23. Mrs. Wallace B. White, 1790 Broadway, New York 19, Secretary.

STUDENT AMERICAN MEDICAL ASSOCIATION, Sherman Hotel, Chicago, May 1-4. Mr. Russell F. Staudacher, 430 N. Michigan, Chicago 11, Executive Secretary.

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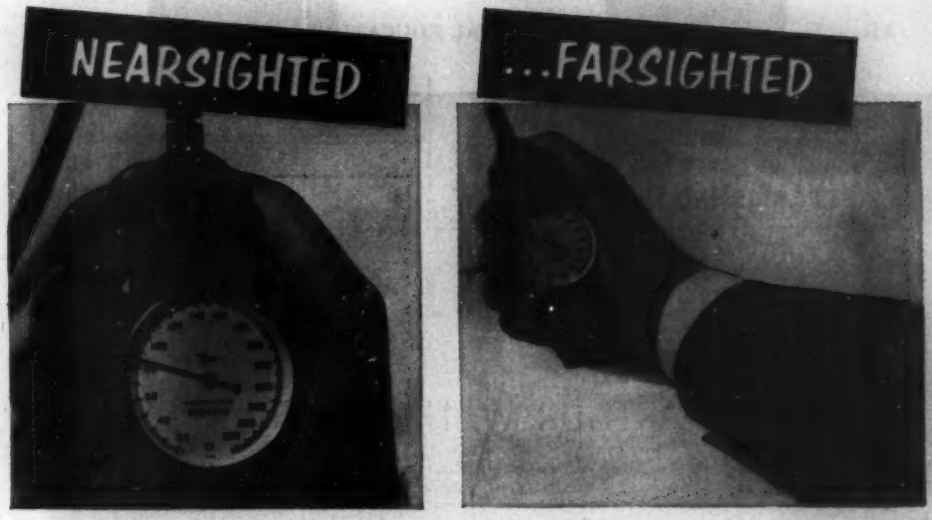

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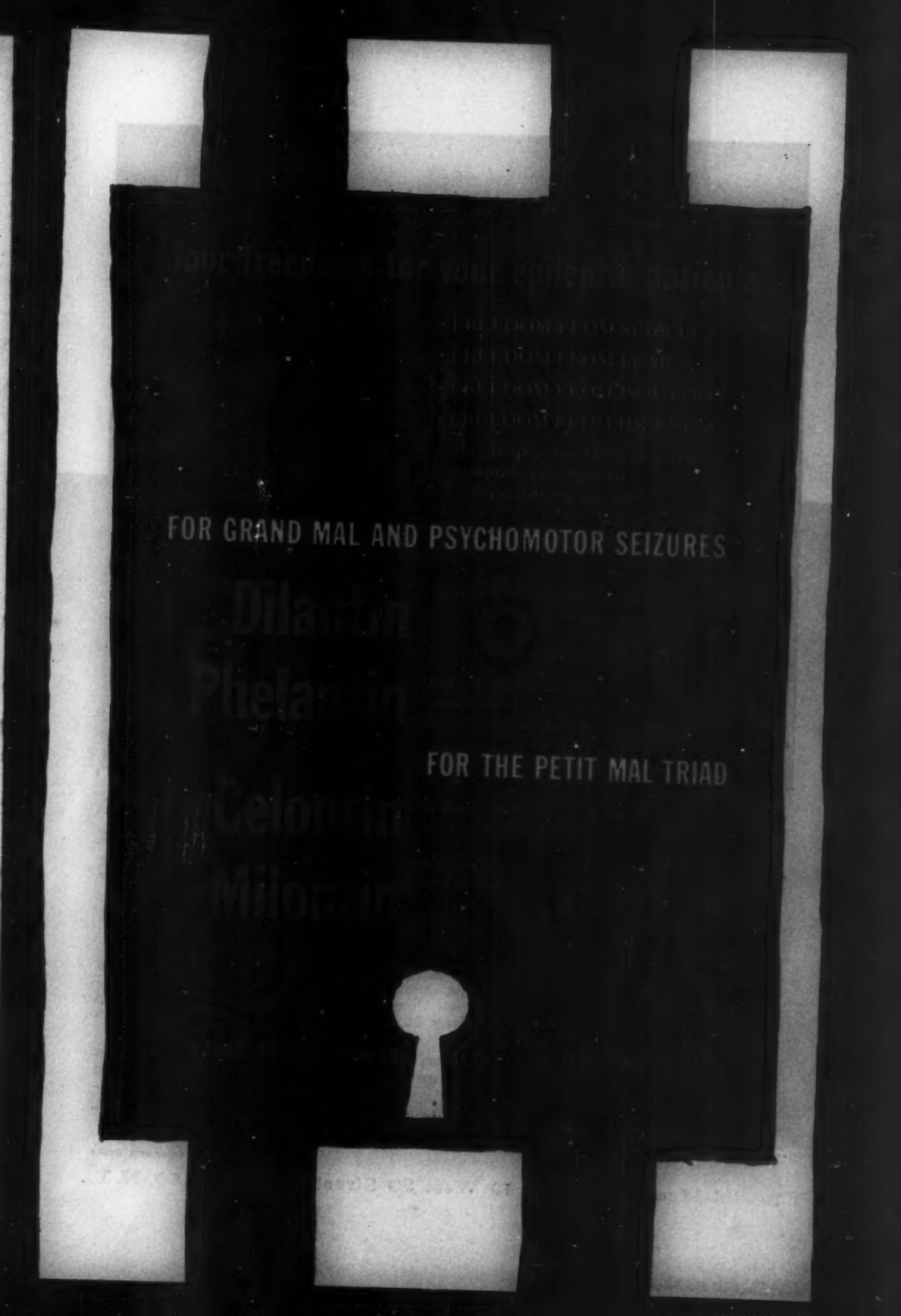
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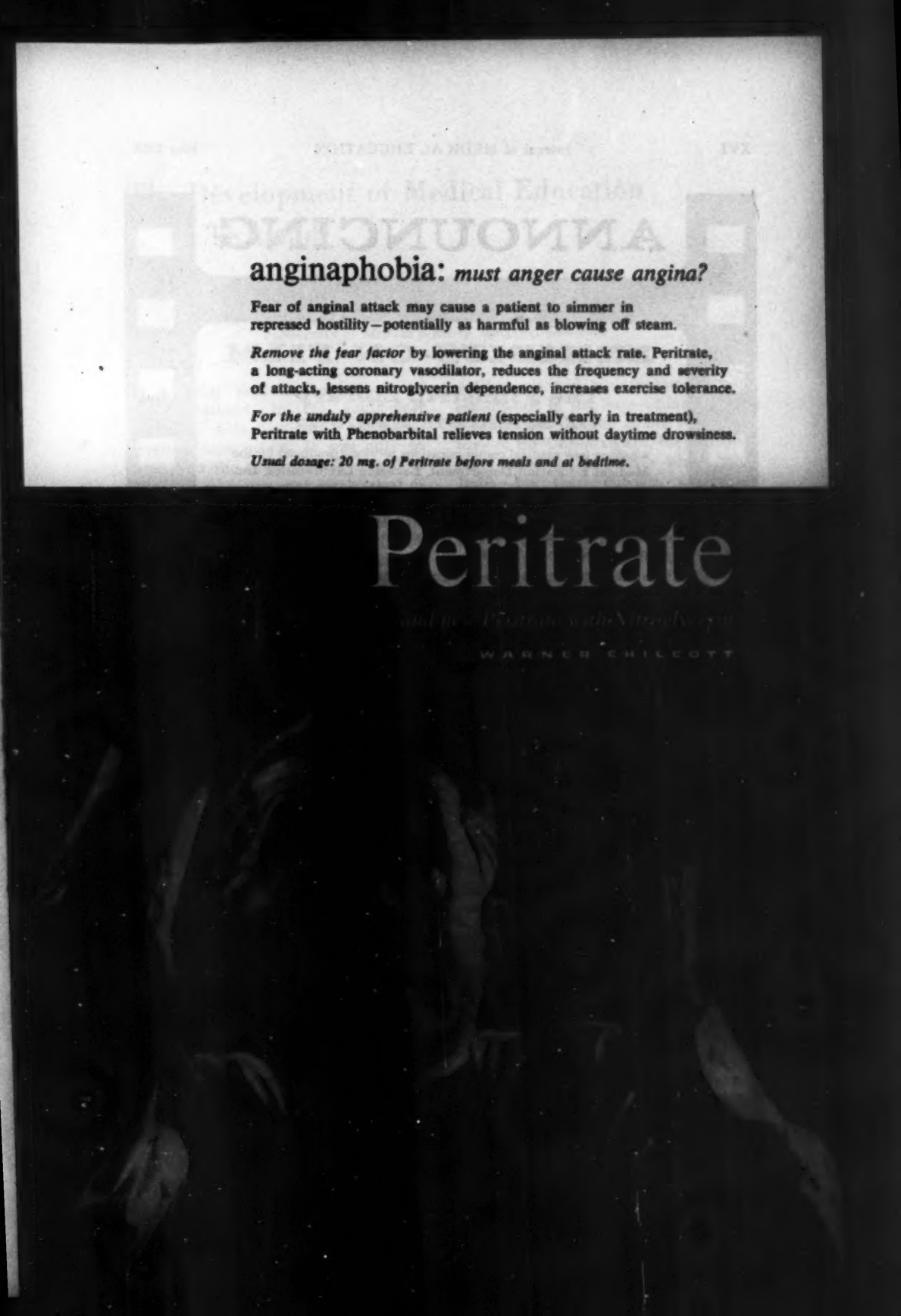

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FILMSTRIP 2 Part I *The Hands in Arthritis and Related Conditions* • Darrell C. Crain (Washington, D. C.) • Certificate of Merit • Part II *Intramuscular Iron for the Treatment of Iron Deficiency Anemia in Infancy* • Ralph O. Wallerstein, and M. Silvija Hoag (San Francisco)

FILMSTRIP 3 Part I *Bronchial Asthma* • John W. Irwin, Irving H. Itkin, Sandylee Weille and Nancy Little (Boston) • Honorable Mention Award • Part II *The Direct (Open) Surgical Repair of Congenital and Acquired Intracardiac Malformations* • C. W. Lillehei, H. E. Warden, R. A. DeWall, V. L. Gott, R. D. Sellers, M. Cohen, R. C. Read, R. L. Varco and O. H. Wangensteen (Minneapolis) • Hektoen Gold Medal for originality and excellence of presentation in an exhibit of original investigation

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The Development of Medical Education in Thailand

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MODERN MEDICAL education in Thailand, in the south-east corner of Asia, has had a comparatively recent origin. It was only in 1889 that the first medical school of Western medicine was established at the Siriraj Hospital by royal command of that benevolent absolute monarch—King Chulalongkorn, son of King Mongkut of the "Anna and the King of Siam" fame. This first institution of higher learning, which later became known as the "Royal Medical College," was destined to become the chief nucleus of the university that followed many years later, and has been the ever-important seat of modern medical education up to the present time. Perhaps, it would not be amiss to pause momentarily here to look briefly into the past in order that a few questions may be answered as to why Western medicine should have come rather late, in spite of a 4-century contact with Western nations and what was the original type of local medicine.

THE OLD TYPE OF THAI MEDICINE

The Thai race, according to historians, is one of the oldest in Asia, so must have had some traditional medical lores of their own while they lived in what is now central China. However, as they gradually migrated southwards and later became firmly established in the Indo-Chinese Peninsula about the end of the 13th century of the Christian era, they turned their faces to the West—which was India—for their culture, arts, religion, and even writing. Medicine came with religion and culture, as has been the case in all world annals. Thus, the old Thai medicine, which has been handed down to this day, is distinctly "Ayuravedic" in nature.

THE AYUDHYA PERIOD

Association with Western nations really began after Ayudhya became the capital of the country in the 16th century, after the intrepid Portuguese sea-farers gained access to this part of the world following the first voyage of Vasco da Gama around the cape of Good Hope. According to historical accounts, the Portuguese were the first people from the West to reach Thailand. They first came to establish friendly relations and obtained permission to trade in 1511. They rapidly rose to the position of a favored people as teachers of fire-arms and for the part they had played as volunteers in the Thai army in a victorious war with a neighboring country. The irony was that the enemy was also taught the use of fire-arms by these same people. The Portuguese community in Ayudhya at that period numbered several hundred persons, and it may be rightly assumed that there must have been surgeons and

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physicians among them practicing the art of Western medicine, because a few ointments, some to be used in lieu of surgery for boils and carbuncles, have been handed down to this day.

Early in the first decade of the 17th century came the Dutch and English traders. However, neither peoples left any permanent imprint on the Thai soil. It then remained for the French, about half a century later, to attempt to establish a strong foothold in the Kingdom in the reign of King Narai. Embassies were exchanged with Louis XIV of France, through the negotiations of the chief Minister of the Kingdom—a Greek by birth. Time was also ripe for France to establish friendly relations with Thailand for two good reasons: One was religious in nature, the Jesuit Fathers being desirous of implanting Christianity into this part of the world by making Ayudhya, then a great trade center, the Bishopric of the Far East. Secondly, France was at war with the Dutch in Europe, while Thailand was also in a strained relation with the same people in the Far East. It was only natural that these two nations should join hands against the common enemy. Louis XIV subsequently sent military officers and engineers to assist King Narai. The engineers helped to build fortifications in many strategic towns, and those fortifications were later garrisoned by French troops.

The French must have introduced many other good things into the country, including Western medicine, which had seen much advancement about the middle of the 17th century. There were records of a French physician treating King Narai for some ailments, the prescriptions for which are still in existence today. However, French influence could not be long endured for political reasons. Thus, on King Narai's death, friendly relations with France were completely severed. This episode might have been well and good for the nation in several respects, but for science it was undoubtedly a great drawback. Western culture, and especially Western medicine, was destined to be totally lost to the country for the next century and a half. Relations with other Western countries also gradually declined until the sack of Ayudhya by the enemy in April, 1767.

The Bangkok Period

After the fall of Ayudhya, the Thai were kept busily engaged in the wars to regain their independence, to unite the various factions arising from the temporary chaos, and finally to regain the former dependencies. This lasted all through the 15-year reign of King Phya Tak Sin. The next 28 years, during the entire reign of King Rama I of the present Chakri Dynasty, saw still more wars, which were wars to preserve that independence. Thus, up to the end of the 18th century, no contact was made with Western nations. While about this time, the French Revolution was also in progress in Europe.

The revival of friendly relations with Western countries had to wait until the reign of King Rama II (1809-1824), when a trade envoy was sent to Bangkok by the Portuguese governor of Macoa. Relations with the British were also resumed in 1822, to continue to grow steadily during the ensuing years.

It remained for the Americans, however, to seriously introduce Western medicine into the country, thus laying a foundation for the present system of medicine today. The missionaries of the American Presbyterian Mission Board first came to

Thailand in 1828. Their purposes and objectives were quite unique in that they were concerned with body and soul at the same time. Thus, several of them were doctors of medicine as well as preachers of the gospel. In this manner, modern medicine was gradually introduced to the people. They were the first to perform vaccination against smallpox in 1837. Their influence was felt not only in Bangkok, but also in many rural areas where missions had been set up. The Americans were destined to play a major role in the medical destiny of the country in the years to come.

The Advent of Hospitals

The periodic epidemics of cholera, however, were responsible for the setting up of temporary hospitals in Bangkok to take care of the people afflicted, and to act as centers for dispensing medicine to the sick. Since Bangkok became the capital, many such epidemics were recorded. One of the severest visitations occurred during July and August of 1849 toward the end of King Rama III's reign, when the total toll of deaths was estimated at 15,000. The last occasion on which temporary hospitals were again needed was during the severe epidemic of 1882 in King Chulalongkorn's reign, when 48 such hospitals were built to cope with the outbreak. After normalcy was restored, the King saw the advisibility of permanent hospitals for the people. A hospital committee was appointed in 1887 with the prime objective of setting up the first hospital of the country in Bangkok.

The Siriraj Hospital

The Committee chose the site of the old Wang Lang Palace on the west bank of Choa Phya River as the location for this first hospital, which was to become the most important center of modern medical education in subsequent years. About this time, H.R.H. Prince Siriraj, a beloved son of King Chulalongkorn, had died after a brief illness. His cremation was scheduled to take place in 1888. The King ordered that the elaborate crematorium and all furnitures for this occasion be built with teak wood, to be given over for the purpose of construction of the hospital after the cremation. The hospital was soon completed and opened to the public on the 26th of April, 1888. The king was graciously pleased to name this new and the first permanent hospital of the country the Siriraj Hospital, as a memorial to H.R.H. Prince Siriraj.

In the early days of Siriraj Hospital, two types of medical treatment were offered to the public, i.e., the Thai medical and Western medicine. Patients could have either one at their own choosing. The Medical Director of Western medicine was Dr. T. Hayward Hays, an American of the Presbyterian Mission, with Dr. P. Gowan of the British Embassy and physician to the Royal Household, as a visiting doctor. The nobles were encouraged to send their sick servants and retainers to the hospital for treatment, thus setting a good example for the general populace. It had been said that sometimes bonafide patients were quite scarce, and to fill up hospital beds patients had to be hired to come to the hospital—or that even beggars would do just as well! One cannot help be filled with wonder that today, only 69 years later, Siriraj Hospital beds have never been enough for those who want to be admitted for treatment, in spite of all the additions and extensions to almost 1,000 beds at present; and the

out-patient clinics have come to take care of about 1,000 patients daily, with the number still on the upward trend. Other hospitals all over the country are meeting with the same phenomenon.

The Founding of a Medical School

When the Siriraj Hospital was established in 1888, the King's Committee also had in mind the formation of a medical school for training students in the arts of Western medicine. The Ministry of Public Instruction signed a contract with Dr. T. Hayward Hays, appointing him a professor and director of study. A faculty was formed, and the medical school opened its doors for instruction in April, 1889. The medical course was set for 3 years in length. The entrance requirements were not strictly laid down, but the ability to read and write was essential. As an incentive to prospective candidates, the school also offered free board and lodging with a monthly stipend and also per diem. In this first class of medical students, there were 40 enrolled at the beginning. The number, however, gradually dwindled, until finally there were only 15 left, 9 of which graduated 3 years later as the first locally trained modern doctors in the country. The final examinations included the subjects of anatomy, physiology, medicine, surgery, pharmacology, pharmacy, and obstetrics. It is interesting to note that one member of this first class still survives his class-mates and is actively practicing as a country doctor.

Dr. George B. McFarland

Dr. T. Hayward Hays continued his service as professor and director of study for only 2 years, when Dr. George B. McFarland was called back from the United States and offered the job. This was an important turning point in the history of the medical school. Having been born in Thailand, a son of American Missionary parents, Dr. George B. McFarland had many advantages over his predecessor, one of which was his ability to read, write, and to speak the Thai language as well as any native. He held the degrees of both M.D. and D.D.S. His teaching was done completely in Thai with many words even coined for some of the technical terms. He was also the author of the first English-Thai dictionary, which was long in use in the country, and author of several Thai text-books on anatomy, elementary physiology, and diseases of the nervous system. Dr. George B. MacFarland devoted nearly his whole life to the interests of the medical school. He may be rightly named the father of modern medicine in Thailand. In recognition of this meritorious service to the country, H.M. the King was graciously pleased to confer upon him a title of nobility—"Phra Arjvidyakom."

Under Dr. George B. McFarland's competent tutelage, the school continued to improve and passed through many significant stages of development. In 1900, King Chulalongkorn and Queen Soavabha came to open the new administration and other school buildings and presented diplomas to the new graduates. The school was also given the name of the "Royal Medical College" on this same occasion. The number of students in one class was limited to 20.

In 1903, the medical course was extended to 4 years, with the enrollment increased to 100 per class, and 10 years later it was further lengthened to 5 years. With the founding

of Chulalongkorn University in 1916, the Royal Medical College was amalgamated with this newly formed university, becoming its faculty of medicine in 1918. The medical course was then extended to 6 years, the first 4 years being spent in the compounds of Chulalongkorn University and the last 2 at Siriraj Hospital.

H.R.H. Prince Mahidol of Songkla

About this time, when the school was passing through a vital transition, amidst all the important changes, there arose a personality quite unique in many directions, who was to instill a profound influence in shaping the course of modern medicine in this country. H.R.H. Prince Mahidol of Songkla, a son of King Chulalongkorn and the August Father of the present King, became interested in medical and public health work. He forsook his past training and career as a naval officer to take up what his mature mind had seen would be more beneficial to his country and people. To be more properly qualified in public health service, he left the country for the U.S.A. to enroll as a student in the school of Public Health of Harvard University and obtained a certificate in Public Health a year later. On returning home and starting to help in the Public Health Service, he soon found out that to be able to really improve the existing conditions, more qualified doctors were much needed. His attention was then turned to medical education and the existing medical school as a fountain-head for future doctors of the country; and, to be of real service in this direction, he himself had to be qualified as a physician. Once his mind was made up, nothing could deter it from these objectives. With his family, he returned to the United States, entering Harvard Medical School as a 1st year student, his past studies in Europe having satisfied all the requirements for admission. Thus, was started a long grind to the profession closest to his heart. After some brief interruptions, when he was called back home for official duties, he was graduated with the degree of Doctor of Medicine cum laude in the class of 1928, his health also failing rather rapidly. A Prince of the royal blood, next in line to the throne of the kingdom, now a full-fledged doctor of medicine, was quite unique in itself and unheard of in the annals of this country or anywhere.

With preparation for himself for the work ahead, he also tried every means in his power to pave the way for the desired end. He gave his all for medical and nursing education. While in Bangkok for brief periods during his undergraduate days at Harvard, nothing delighted him more than frequent visits to the medical school and the teaching of premedical and medical students. Promising students were hand-picked by him and sent to the United States on his own personal funds to complete their medical education. Nurses were treated likewise. He was likewise instrumental in bringing help from the Rockefeller Foundation for a complete reorganization of the medical school, including pre-medical education. When any deficits occurred in the construction program in the medical school and Siriraj Hospital, he generously contributed his personal funds for the purpose. He hired foreign nurses to come and help in the School of Nursing and Midwifery. To stimulate scientific investigations, he established research grants in the medical school. And finally, while in bed during his last fatal illness, he made a will donating 500,000 baht

(about $200,000 at the rate of exchange then) to the medical school and Siriraj Hospital. The income from this fund was to be spent for the specific purpose of sending doctors, nurses, and pharmacists of the school and hospital abroad to further their studies.

All Thailand mourned his premature death in 1929, a little over 1 year after his graduation from Harvard University. His name has become sacred in medical, public health, and nursing circles. He had begun his work well; his name and past deeds will always provide a great and undying inspiration to all who follow his footsteps. With a central figure such as he for everyone to look up to, the future of medical education in this country is made more than doubly sure.

Assistance from Rockefeller Foundation

With H.R.H. Prince Mahidol as intermediary and later appointed official representative of the Thai government with full powers, the long negotiation with the Rockefeller Foundation was finally concluded and the contract signed in 1923. The Foundation agreed to assist in the reorganization of the medical school and its teaching hospital at Siriraj by providing professors to head the six major teaching departments in the pre-clinical and clinical areas, one of them to be appointed dean of the school and medical director of the hospital. Fellowships were granted to prospective members of the teaching staff to go abroad for further studies for 1 year, totaling 19 in all. In the construction program for the school and hospital, the Thai government was to match every building built by the Foundation. The Foundation was to supply all the necessary teaching equipment for the four classes of 25 students each. The entire medical curriculum was to be completely revised to modern standards, the 4-year course after 2 years of pre-medical work leading to a medical degree; and, finally, the medical graduates from this degree-course must be assured of satisfactory remuneration on entering government service. With Professor Aller G. Ellis, the head of the department of pathology as dean, the Rockefeller Foundation supplied professors of medicine, surgery, obstetrics and gynecology, anatomy, and physiology to the school. Under this program, the school began to gain a new outlook and steadily prospered. The original contract was for 5 years only, but was finally extended to 12 years, during the latter part of which only two foreign professors remained in pathology and surgery, the remaining chairs being taken by Thai professors. At the expiration of the period of cooperation, Professor Aller G. Ellis entered the Thai government service, continuing his service as dean of the faculty of medicine and later was elected chancellor of Chulalongkorn University, serving in this capacity until his retirement. His name will long be remembered as one of the greats in the history of medical education of this country. As regards the world-renowned humanitarian organization he represented, words are too inadequate to describe Thailand's deep feeling of gratitude for what it has done for medical education of the country.

The Second Medical School

It soon became apparent that the limitation of student enrollment to 25 per class, as set down in the original program with the Rockefeller Foundation, was too inadequate to

meet the demands of the country. Facilities for training were gradually increased and extended until, just before the beginning of World War II, the faculty of medicine and Siriraj Hospital was able to take in as many as 100 students in a class. However, in 1944, the enrollment rose to 180 in the 1st-year class, almost doubling the existing capacity. The faculty of medicine and Siriraj Hospital had been transferred to the newly formed University of Medical Sciences since 1943, under the new Ministry of Public Health. There were increasing demands for medical graduates for medical and public health services of the country, so increased enrollment in the medical school became imperative. To cope with the situation, the medical school was strained to the utmost, as all teaching facilities were very limited. Teaching had to be done in shifts. It was hoped that this state of affairs would be only temporary. However, such was not the case. Therefore, to assume some of the load, another medical school became a necessity. The Chulalongkorn Hospital of the Thai Red Cross Society, the second largest general hospital in Bangkok with efficient hospital staff, was considered the most logical institution to which a new medical school could be attached. Plans were finally concluded with the Thai Red Cross Society concerning the affiliation of Chulalongkorn Hospital for the purpose of medical education. The second medical school, under the University of Medical Sciences, was then set up by an amendment of the University Law in 1947, with the name of the "Chulalongkorn Hospital Medical School." This school follows the same teaching program as that of the older school at Siriraj Hospital and has a capacity of 60–80 students per class.

Program of Technical Assistance from U. S. Government

Under the E.C.A. (Economic Cooperation Administration) of the United States Government, technical assistance to Thailand was extended to include medical and nursing education. Beginning in 1951, funds were made available to members of the teaching staff for further study and training in the United States. Through this agency, an exchange program was contracted with Washington University, St. Louis, Mo., for 2 years, whereby Washington University was to send experienced people in various fields to assist in the work of the two medical schools and the teaching hospitals. At the termination of the contract, a number of surgeons, pathologists, bacteriologists, biochemists, physiologists, hematologists, anesthetists, nursing educators, nurses, and technicians from the Washington University group had spent varying periods of from 3 months to 2 years in the two medical schools and hospitals. This medical education exchange program has accomplished much in promoting and enhancing good will and understanding between the two peoples.

Under the M.S.A. (Mutual Security Agency) and the F.O.A. (Foreign Operations Administration), the program of technical assistance continued unabated. With the present I.C.A. (International Cooperation Administration), more emphasis has been given to medical education, the assistance being given in the forms of training grants, funds for necessary teaching equipment and technical personnels. Since the inception of this program in 1951, more members of the teaching staff have been able to go to the United States for study and training than ever before. Those

trainees who have come back have ably demonstrated that all the troubles and expenses spent on them have not been in vain. Both schools have gained enormously from this experience. It is to be hoped that the program of assistance may be continued for many more years to come.

The China Medical Board of New York, Inc.

About the same time that the U. S. Government initiated the program of technical assistance, the China Medical Board of New York, Inc., also became interested in the medical schools. After a visit by the director of the Board in 1951 and later subsequent visits, the Board has been pleased to grant substantial funds for textbooks, microscopes, fellowships to study in the United States in library science and a few other specialties, and a research grant in tropical medicine. Funds have also been provided for special teaching equipment. The Board was also one of the chief sponsors of the first Thai National Conference on Medical Education in 1956. It is hoped that the China Medical Board of New York, Inc., will continue to take active interest in medical education of Thailand, until our medical schools are placed on a firmer footing than ever before.

Fellowships from Other Organizations

Medical education at post-graduate level also owes much to the United Nations organizations and many other institutions. The World Health Organization has offered a number of fellowships for the purpose of sending senior staff members of the medical schools for short-term study tours abroad. The International Institute of Education and the Fulbright Foundation have enabled several graduates to further their studies in the United States, on a competitive basis. The British Council has also been giving fellowships to graduates in various fields of endeavor, and thus far a majority of the successful candidates has been in the field of medicine. Fellowships are now being offered from Germany and France for medical graduates to do graduate work in the respective countries. The Colombo Plan is also a more recent source, whereby fellowships may be obtained for medical education at both undergraduate and graduate levels. All in all, it may be said that the aforementioned organizations and institutions are also playing an active role in strengthening Thailand's medical education at various levels.

First Thai National Conference on Medical Education

The University of Medical Sciences has long felt the need of a medical education conference among educators and those interested in medical education for the purpose of revising the present curriculum, set up over 30 years ago during the reorganization of the school by the Rockefeller Foundation, in order to conform to modern standards and also to meet the present demands of the country. With the generous assistance from the China Medical Board of New York, Inc., and the I.C.A., the University decided to hold the Conference from November 25, 1956, to November 30, 1956, inclusive, at the seaside resort outside Bangkok. The objectives of this First Thai National Conference on Medical Education were set as follows:

1. To survey present Thai practices in medical education in detail.
2. To survey present practices in medical education in other countries.

3. To decide upon present defects in Thai practices.

4. To make recommendations for the correction of the defects decided upon under Objective No. 3.

After careful deliberations, the Conference finally made recommendations, which may be summarized as follows:

Objectives of Thai undergraduate medical education—The Conference accepted the concept that the medical schools have three major responsibilities: teaching, the care of patients, and research, in that order of priority.

The Conference also agreed that the major need of Thailand was for general practitioners. The medical graduate should have acquired the fundamental knowledge, skills, and attitudes of a doctor and should be capable, after an additional year or more of training, of becoming a general practitioner or specialist. The curriculum should encourage habits of self-education which will continue throughout his professional life. The preventive, mental, socio-economic, and genetic aspects of disease should be dealt with as well as the physical. Emphasis should be placed on major problems of the country. The curriculum should *not* attempt to give a student a detailed systematic knowledge of all fields of medicine.

Premedical education—The conference favored a minimum of 2 years premedical study of the new 5-year science course of Chulalongkorn University. Certain additions would be taught during the first year of medical school, to make up for deficits which cannot presently be remedied within the premedical period. It is hoped that natural developments will lead to a longer premedical education.

Student selection—The conference agreed that there should be selection of students. It was suggested that, in addition to an academic record, methods of selection should include physical and mental examinations, personal interview, and possibly aptitude or other tests. A standing selection committee should be appointed at each school.

Preclinical subjects—The preclinical teachers felt that the present hour allotment was adequate, subject to minor rearrangements. Improvement in preclinical teaching depends to a large degree on quantitative and qualitative improvement in teachers, technical personnel, facilities, and better prepared and selected students.

Course content will require periodic revision to conform to the objectives of undergraduate medical education. Improved teaching methods and techniques will lead to increased effectiveness.

Clinical subjects—The conference agreed that the major defect in the present curriculum was insufficient emphasis on pediatrics, preventive medicine, and psychiatry. Pediatrics should be a major subject, with revised curriculum and increased hours. Preventive medicine and public health should be first established as a section in the department of medicine, and eventually become an independent department. This course will replace hygiene and public health as now taught.

Psychiatry should form a section in the department of medicine and be developed as a full department, with a revised curriculum and increased hours. In addition, minor adjustments in emphasis, techniques, and hours are needed in other subjects.

Hour allotments, presently in the maximum range when compared with

schools in other countries, could be more effectively used if lecture hours could be decreased, with increased teaching at the bedside and in small discussion groups. This depends, in turn, on better-prepared students, more teaching beds, and more teachers.

Curriculum—The conference agreed that the correlation and integration should be emphasized and experiments tried within the framework of the present curriculum. To assist in achieving this, a committee should be appointed which would help plan, arrange, and evaluate interdepartmental and other forms of correlation and integration.

General curriculum recommendations—The conference recommended that a curriculum committee be established to act upon the recommendations of the conference, and with appropriate subcommittees to carry out continual curriculum evaluation and revision. The "unit system" was approved by the conference as a method for assisting in apportioning time to various subjects. Correlation and integration will likewise aid in this task.

Evaluation of students—The principle of the addition of "year work" to the final grade was approved; this will require closer student supervision, especially in the clinical years. Attendance rules should apply to practical work as well as lecture attendance. Methods of grading should be given further study. Present reexamination policies, including the 2-year limit, should be enforced. In the final year, a 3-year limit is recommended, with compulsory examinations after "make-up" work. Separate examinations for each school were approved.

Teaching support activities—Selected hospital affiliation was approved in principle, as one of the means for relieving the shortage of hospital beds for teaching. There is need for improvement of support facilities, such as the library and the medical illustration division.

Internship and residency—The conference recommends an additional year of supervised clinical training before the graduate enters practice.

Faculty development—Persons with the Ph.D., D.Sc., or equivalent degrees could be used to a limited extent. Present methods of teacher selection should be continued, with increased attention to personality and motivation. There is an urgent need for new faculty positions. Recruitment is a particular problem in preclinical departments. This requires inducements, such as special salary supplements and welfare benefits for those who do not practice. Such inducements should also be given to clinicians who do not practice. Affiliation would increase the number of clinical teachers. Salaries are grossly inadequate, especially in the intermediate grades. Prompt and serious consideration should be given to raising them. Staff improvement is related to opportunities to study abroad, attendance at foreign conferences, opportunity for research, availability of adequate technical and secretarial help, and working space. The university should stimulate instruction in the art and science of teaching. There should be an increase in positions for internship and residency, since they are the major source of potential clinical faculty members.

Positions for student assistants and teaching and research fellows would be of the same significance to the preclinical departments. The conference took note of the increasing importance and responsibility of the

dean as the leader of the faculty and recommends the establishment of full-time positions for the dean of each school, with adequate salary and full-time positions for administrative personnel assigned to their offices.

Discussing summary evaluation of the medical graduate committee— The importance of evaluation of the medical graduate as a guide to improving medical education was confirmed. Periodic review of graduates should be made with the assistance of the Thai Medical Association and various government services.

The Present Medical Schools

Medical schools, according to modern concept, have three major responsibilities: teaching, the care of the sick, and research, in that order of priority. Due to too large enrollment, it cannot be said that our medical schools have fully fulfilled the stated responsibilities as yet. Teaching is still somewhat handicapped because of inadequate number of trained teachers. The student-teacher ratio is now 1:4+ for the two schools. Teaching equipment, now insufficient, can be easily procured when funds are available for the purpose. However, teachers cannot be bought; they must be first selected and then trained. This process takes time. However, this must be done at all costs, if teaching is to be further improved. A large enrollment also means an insufficient number of hospital beds for teaching purposes, which may be remedied readily by appropriate affiliation with other Bangkok hospitals. As to caring for the sick, both schools are doing their job well. However, this also may be improved by having additional staff members. As regards research, there is much room for improvement. The load of teaching and caring for patients is now too heavy for the faculty; little time is left available for proper scientific investigations, which are so important in medical education. However, it is hoped that all these deficiencies will be remedied by gradually putting in force the recommendations of the National Conference on Medical Education, and a day may arrive in the near future when Thailand's medical education will be placed on a sound basis, thus fulfilling the objectives laid down at the Conference.

Planning for the Future

Thailand, at present, has a population of 22 million, and at the present rate of natural increase, it will be over 30 million in the next 20 years. The present doctor-population ratio is about 1:8,000 in the country as a whole; but the concentration of doctors in Bangkok and other large cities makes this ratio unrealistic for the rural areas. A reasonable goal would be to reduce this ratio to 1:4,000. This would require 8,000 doctors in the year 1978. Allowing for death, retirement, and the possible loss of woman doctors through marriage, this would mean that approximately 7,000 doctors must be graduated in the next 20 years. The two existing medical schools, which are already exceeding capacity, cannot be expected to produce more than 280 graduates per year. The 20-year total would be 5,600, leaving a deficit of 1,400 doctors. The country must have at least three more medical schools within the next 10-year period to cope with the situation. Therefore, the University of Medical Sciences has a long-range plan to set up three more medical schools, one in the northern part of the coun-

try, one in the north-east, and one in the south, in that order.

The I.C.A. has concurred wih this planning, and assistance will be forthcoming from this agency in the establishing of the third medical school in the city of Chiengmai in the northern part of the country, with the expectation that the first class of about 50 will graduate in 1964 or thereabouts. This will help to relieve some of the deficit in the number of doctors. The fourth and the fifth schools will have to wait until a more opportune time comes in the not-too-distant future.

Abstracts on Programs of Medical Education for Annual Meeting of the Association

The annual meeting of the Association of American Medical Colleges will be held at the New Ocean House, Swampscott, Massachusetts on October 13-15, 1958.

The Program Committee will welcome abstracts describing experiments and programs in medical education and in health services related to medical education. This may include premedical, medical, graduate and postgraduate education. It may include methods of education and of research in education. Since educational projects are inherently long term in nature, abstracts describing programs either projected or in progress will be considered.

The following regulations concerning abstracts and presentation of papers have been approved by the Program Committee and the Editorial Board of *The Journal of Medical Education:*

a) Three copies of the abstract are to be sent to the Chairman of the Program Committee: Dean Lowell T. Coggeshall, University of Chicago, Chicago 37, Ill.

b) The abstracts are required by July 15, 1958.

c) Abstracts should not be longer than 250 words: no tables or charts are to be included. The title of the paper should be followed by the names of the authors; their faculty rank, their university, institute, or hospital and its location. Abstracts must be typewritten, double spaced on 8½ by 11 inch paper.

d) The time allowed for presentation of any paper will be ten minutes. Projectors will be provided for lantern slides 3¼ x 4 inches or 2 x 2 inches.

e) Acceptable abstracts will be published in *The Journal of Medical Education* at the time of meeting.

The formal paper will be considered for publication by the Editorial Board of *The Journal of Medical Education.*

The Place of Genetics in a Contemporary Curriculum of Medical Studies*

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IF ONE UNDERTAKES to discuss the place of genetics in a contemporary British curriculum of medical studies, one starts at a disadvantage I can best clarify by reference to a local situation. Some years ago, the faculty of which I have the honor to be a member decided to create a part-time chair of Gastroenterology. The proposal went through without disagreement, because we could approve the considerable merits of the only possible candidate, both without partisan loyalties to, or distaste for, a national Eupeptics Society financed by the back bench of the Conservative Party and without misgivings about whether the professor appointed would attract funds by toeing the Eupeptic party line. In Britain, we must, alas, discuss any issue which impinges on human genetics with the uncomfortable recognition that there exists at the lunatic fringe of medicine a Eugenics Society which, at least in the thirties, drew its support largely from a vocal minority of adherents to the Nazi ideology of *Rassenhygiene*. Even now, Professor Darlington has emerged in our midst as a protagonist of the same viewpoint, unscathed by a war which ended with ritual sacrifice of the redoubtable Alfred Rosenberg.

The theme of what follows is that genetical enquiry can make a considerable, and as yet unmade, contribution to medical science, that its major contribution as I see it has very little to do with what we commonly understand by eugenics, even if pruned of racial prepossessions, and that it will not be possible to assess how important it is unless we recognize how exiguous are the claims of the eugenic viewpoint in the domain of preventive medicine. At the outset, it is therefore fitting to emphasize why it is all too easy to overstate the claims of genetics as an instrument of policy in the preventive domain. To do so, I must briefly and reluctantly recapitulate views and terms which I have elsewhere put on record. We need to retrace our steps through a quagmire of semantic ineptitudes if we hope to get the legitimate claims of genetics into focus at any level; and if we hope to discuss in a rational temper any issue involving genetic principles, we must first relinquish the luxury of misleading terms such as familiar traits or hereditary characters. Traits or characters are end-products of a developmental process in which there are highly intricate reactions between an initial equipment, we may call *nature*, and extrinsic physical and social agencies, which we may collectively call

*Being an Address delivered to the First Annual Meeting of the British *Society of Social Medicine* (September, 1957), some of the policy suggestions in it have relevance only to English Medical Schools.

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nurture, including thereby what I ventured some 30 years ago to subsume under the epithet *uterine environment*. All one can legitimately convey by human *heredity* or *nature* in a biological, in contradistinction to a legal, context is the initial material contribution of the sperm and the ovum to the direction in which the developmental process proceeds. Accordingly, the subject matter of genetics is not a particular class of characters, but the effect on every attribute so labeled of one or other *gene substitution* in a specified nurture framework and a specified complex of all other genes.

After this preliminary dismissal of one source of mental confusion about the claims of genetics in a medical curriculum, it will also clarify the major issues for further scrutiny, if we now make a threefold split of gene substitutions as follows. By *quasi-compulsive* gene substitutions I designate such as lead to one or more highly characteristic end products which we may call *marker characters* in a range of environmental variation and genetic make-up so wide as to include most situations consistent with viability. By *extra-limited* gene substitutions I signify such as lead to one or other characteristic end product in a restricted environmental situation, e.g., the gene substitution which eliminates the appearance of antennae in Drosophila if, and only if, the culture medium contains one of the B vitamin complex. By *intra-limited* gene substitutions I label those whose recognizable effect, if any, depends on the particular gene complex which we may call its bedfellow. In the human domain, I strongly suspect that the blue sclerotic-deafness-*os fragilis* and that the Lawrence-Moon-Biedl syndromes belong here. Needless to say, the last two categories are not exclusive. A gene substitution may be both *extra-limited* and *intra-limited* in my vocabulary.

What is equally important to dismiss is the notion that these two classes are out of the ordinary. That we are too apt to think of the subject matter of genetics primarily in terms of quasi-compulsive substitutions admits of a simple enough explanation. Were there no such, it would have been well-nigh impossible to stumble on the basic principles of genetic architecture enshrined in the chromosome maps of species. Accordingly, we hear most about them in an elementary course of instruction, and the student of genetics therefore gets to think of them as the representative class, in contradistinction to the class most easy to handle. By the same token, we think of some end product, which I have labeled a *marker* characteristic, as the unique effect of the gene substitution, but for no better reason than because we score our records by reference thereto. When we elliptically speak of the sex-linked white eye gene of Drosophila, we should do so with the reservation that very few gene substitutions have so characteristic an influence on the developmental process in so wide a range of extrinsic variation during the developmental process and that white rather than red eye is by no means necessarily the only recognizable outcome which the same gene substitution may have in one and the same gene complex and in one and the same environmental framework.

The last remarks would be trite if experimental geneticists refrained from the use of such highly misleading terms as *modifying genes*, an expression which conveys to the neophyte the impression that some genes are modifying, others not. To be

sure, one may sometimes forgivably dispense with the foregoing refinements of discourse when dealing with animal or plant genetics, because one can then deal with gene substitutions one at a time, in the Baconian way. By using closely inbred stocks, as did Mendel and the other pioneers, and by using a highly standardized regimen of culture brought to push-button level of perfection in the fruit fly saga, we can eliminate all, or nearly all, contributory variations of the gene complex as a whole or of the nurture component of the developmental process. We can do neither one nor the other when our experimental material is human; but this circumstance does not distinguish human genetics as such from all other branches of human biology. We can justly assess the claims of genetics in the medical curriculum only when we realize an essential difference between animal physiology or animal pathology on the one hand, and human physiology or human pathology on the other.

I shall not apologize for emphasizing this distinction, because our legitimate use of the term *experimental pathology* obscures the issue on one level, and our misleading use of the term human physiology more often than not for the physiology of the frog, rabbit, rat, guinea pig, golden hamster, ferret, cat or dog confuses our thinking at another. In animal physiology, as we usually use the term in a sense which excludes genetics, and in animal pathology equally, our major preoccupation is with nurture. We do indeed, or should be able to, deal with it as such because we can partial out heredity in the contemporary idiom of statistics by recourse to genetically standardized material such as the Wistar Institute strain of white rats. Just as we cannot standardize, or at least only imperfectly and with great difficulty, the nurture component of the human developmental process for the study of human inheritance, we cannot standardize the nature component for the study of human physiology or human pathology except insofar as we restrict our observation to pairs of monozygotic twins. Because we too easily overlook the consequences of this limitation, it is all too easy to exaggerate how much we can learn about human genetics with methods at our disposal.

If we recognize it as such, it is clear that the most refined methods of analysis applied to pedigrees, and population statistics can tell us little about any class of human gene substitutions other than the class I have labelled *quasi-compulsive*. This includes two sub-categories: (*a*) about at most 30 so-called familial and hereditary conditions; (*b*) serological differences. I should not like to set a limit to how much further advance the immediate future will record in the domain of the second category which is not without some interest to preventive or curative medicine in terms of incompatibility risks; but I do assert with confidence that there is no immediate prospect of greatly enlarging our existing knowledge about the first. My reasons for stating so are: (*a*) refined statistical analysis of population data is only applicable to rare conditions; (*b*) a large-scale hospital survey undertaken by the M.R.C. at my suggestion in the mid-thirties failed to tell anything noteworthy about such rare conditions other than to confirm what we already knew. The fact that the so-called familial and hereditary diseases, of which we can identify a gene substitution as the predominant aetiological component, are also rare emphasizes that their interest to

preventive medicine is trivial. If they are lethal, as is true of several, including either form of Tay Sachs disease, we may assume that selection is in equilibrium with mutation. It follows that the most rigorous enforced selection, if socially practicable, could achieve no useful outcome.

In short, it seems to me that the claims of genetics in a contemporary curriculum of medical studies are very weak if they rely only on such considerations as the eugenists advance; but my concern in this context is to put forward a different criterion of usefulness. I can do so only if I now digress to discuss the implications of the term *aetiology*, derived from the Greek word *aitia* for *cause*. As an undergraduate at Cambridge before World War I, it was my privilege to listen to Bertrand Russell when he delivered in Trinity the course of lectures published under the title *Our Knowledge of the External World*. The one which made the most lively impression on me (also republished in *Mysticism and Logic*) was the one with the title *The Notion of Cause*. During the first 30 years of my professional career, I never used the word *cause* in a lecture; but I have now lapsed into doing so, because the inherent danger lies less in the use of the noun than in the use of the article which precedes it. While we can never—except elliptically when the context makes the limitations of the form of words explicit—speak with propriety about *the* cause of an occurrence, we can speak of *a* cause without clouding the issue. Thus we rightly conceive its province only if we regard aetiology as the disclosure of a *causal nexus* in contradistinction to the identification of a singular cause.

In its simplest terms, a scheme which can convey an exhaustive biological approach to the elucidation of such a causal nexus will be a three-dimensional grid. Along one dimension we then conceive a lay-out of the several taxonomic criteria definitive of a particular syndrome. Along a second we conceive different realizable combinations of extrinsic variables, uterine and post-natal, physical and social. Along the third we shall conceive all admissibly different specifications of the gene complex of an individual patient. Needless to say, we can never hope to have all the data to fill in the cell entries; but a schematization of this sort is none the less a salutary reminder that disease, dysfunction, and malformations, no less than what we call characters of the healthy organism, are, like all attributes of a living being, end-products of an immensely intricate interplay between the class of antecedents subsumed by the terms nature or inheritance as already defined and the class of variables subsumed by the expressions nurture or environment. Until we can indeed approach the patient in this three-dimensional way of thinking, aetiology must remain at every level content with half-truths through our failure to formulate our questions about disease and health in a sufficiently comprehensive way.

Meanwhile, the prepossessions of the investigator perpetuate such half-truths by indoctrination with a one-sided emphasis sometimes on nature but often on nurture. Thus, the student who attends a course on the so-called deficiency diseases commonly learns that a cereal diet exclusively of maize or of polished rice causes (*sic*) pellagra or beriberi, as the case may be. Needless to say, many people who eat polished rice and many people who eat maize and otherwise feed like the victims

of these conditions, never in fact suffer from them. Nor is this surprising. Since carnivors can do without ascorbic acid, it would not be surprising if some human genotypes can do without one or other of the B series. This being so, it is equally proper to speak *either* of failure to synthesize a particular accessory food constituent *or* of absence of the same constituent in the diet as *a* cause of a particular deficiency disease; and if one speaks loosely of one or other circumstance as *the cause*, all one can legitimately convey is that one of several different agencies or circumstances designated with equal propriety by the same word happens to be the aspect of the total situation most readily susceptible to management. The ellipsis would be innocuous were it not for the fact that we evade the challenge to a deeper understanding of the requirements of the human body by curtly dismissing all aspects of the problem outside the scope of *intended action*. *Mutatis mutandis*, what may be said of the literature of the dietetic deficiency diseases applies with equal cogency to most, which is on record with reference to iodine shortage and the prevalence of goiters or to cancer of the lung and smoking. In saying so, I do not wish to convey that genotypic differences necessarily supply the clue to the knowledge we lack. The case history of the individual subsumes a vast range of nurture variables, which may well be as relevant to the enigmas of clinical variation. My sole concern here is to emphasize that the current tradition of interpretation may lean too heavily on the role of one or other class of causal agencies.

What is true of our customary attitude to the dietetic deficiency diseases is even more true of our approach to diseases which fall within the communicable group. In this context a three-dimensional model is no longer adequate, because the causal specification of cell entries in terms of presence or absence of taxonomic criteria definitive of the syndrome must embrace a parasite-host relationship, each component of which is free to vary independently in the two dimensions of the nature-nurture dichotomy. Plant pathologists have made some headway in elucidating the causal nexus at this level of sophistication; but scrutiny of any contemporary text-book on epidemiology discloses a vast array of questions which still await solution, less because we lack the means of finding answers than because we lack the attitude of mind to ask the right questions. To be sure, advances in the genetics of micro-organisms during the present decade have provided enough clues. Meanwhile, epidemiologists continue to beatify the partnership of Topley and Greenwood for no discernible reason other than one I shall state simply in the next sentence. What Topley and Greenwood conclusively showed is that it is possible to make an animal experiment as inconclusive as a statistical inquiry on a human population if one dismisses all Baconian principles by muddling every conceivable issue of nature and nurture at every possible level.

Some may here suggest that the considerations outlined in the foregoing remarks are of relevance to training in medical research rather than to training in the practice of medicine; but are not most students of medicine liable at some time to experience an intellectual malaise which is comprehensible only in such terms? In their pre-clinical laboratory studies, they may and should acquire confidence in accredited scientific interpretation of biological

phenomena by familiarity with experiments in which it is possible to control nature in the process of varying nurture or *vice versa*. At the bedside, treatment and diagnosis inevitably lack the exacting tidiness of a well conducted animal experiment; and an aura of uncertainty which so often engenders lay criticism of the sort we expect to meet in a Shaw Preface is what must needs be, while we know so little about the interplay of both major categories of human variation. Because current teaching does too little to emphasize the sources of variations which only a deeper understanding of human inheritance and developmental physiology can clarify, it fails to inspire a rational confidence which is alien both to irresponsible scepticism and to unreflective reliance on authority.

In short, the plea I am advancing is that some sort of instruction in genetics is an essential ingredient of the medical curriculum less because of its direct usefulness as a guide to preventive action, such as compulsory sterilization or precautionary measures for putative parents with serum incompatibilities, than because it is an indispensible prerequisite to a comprehensively rational attitude to aetiological issues. To promote such an attitude, it is not sufficient to insert in the curriculum a few lectures on familial conditions and blood group crosses in the teaching of social medicine, nor to insist on an extra dose of Drosophilately in premedical courses now largely taken over by the grammar schools. Neither the one nor the other suffices to force the attention of the student on what should be the main end in view, i.e., realization of the immensely complex possibilities of interaction between nature and nurture at every stage in a developmental process rightly conceived as embracing the whole life cycle.

If, as is true of most British universities, a student attends a few lectures on human heredity, so-called, without a thorough grounding in animal or plant genetics, he or she will not be ready to appreciate the methodological difficulties of evaluating the role of nature in populations of organisms which we cannot mate at will, and the few who have had any training in genetic principles at the premedical stage will have had little acquaintance with nature except in the domain of marker characteristics whose exhibition has the double safeguard of recourse to highly standardized genetic material and to a highly standardized regimen of extrinsic agencies incident to development. A course of study in human genetics unfortified by a firm groundwork in animal and/or plant genetics will accomplish little or nothing to promote the intellectual orientation which is the subject of my plea. By the same token, a course in animal or plant genetics unrelated to what experimental embryology teaches us about the possibilities of modifying the developmental process is also inadequate. From the viewpoint of medical science in terms of the plea here put forward, we need to formulate a program of instruction in animal and plant genetics as part of a more comprehensive discipline which the Germans call *Entwicklungsmechanik*, or if you prefer it, *developmental physiology*.

Teachers and administrators will rightly view with alarm and despondency any proposal to bring a new discipline within the framework of an already overburdened curriculum, unless one can advance the prospect of off-loading something else. For that reason, one might well hesitate to offer the suggestion last

made if unwilling to examine the practical difficulties of implementing it. Let me therefore recall three circumstances which are relevant to an acceptable implementation of the proposal in the British milieu:

a) Owing to pressure for space in the universities, we must accept the fact that the grammar schools will continue to take over the function of pre-medical biological instruction.

b) With increasing specialization, surgery and anatomy as a prerequisite to surgery have diminishing claims on curricular time for the many medical graduates who will never be surgeons.

c) The physiologists of an earlier vintage did their job so well that research and teaching of human physiology *sensu stricto* is no longer the terrain of any one department, and can be adequately accommodated at one or other level by departments of pharmacology, experimental pathology, and clinical medicine, each with whole-time staffs in the post-war set-up.

Since it is indisputable that the overwhelming majority of grammar schools are not, and in my view never will be, equal to the task of providing a premedical course in biology of a scope comparable to that of the Universities of Cape Town and Aberdeen during my own tenure of office, we may dismiss the possibility that any change of the content of a grotesquely inadequate School Certificate syllabus will accomplish the outcome which I have outlined. On the other hand, there is no reason why departments of so-called human physiology and of human anatomy should not, severally or jointly, adjust their terms of reference to provide a remedy for the deplorably low standard of school instruction in elementary biology now accepted as adequate. To be sure, few of the present incumbents of chairs are both equipped and disposed to implement such a proposal; but any university is free to make the change without friction, if it seeks out from the ranks of experimental zoologists successors for replacements whenever retirement leaves vacant posts to fill. In the academic set-up, there is an enduring fountain of cheerfulness. While there is death, there is hope.

What I have last said is of special relevance to conditions in England and Wales. I should make it clear that it should be the special responsibility of departments of social medicine to acclimatize medical students adequately indoctrinated by a composite approach to what experiment can teach us about developmental physiology and the genetic architecture of the zygote to the interaction of nature and nurture in the peculiar social environment of a species which continually reshapes its own surroundings. Short courses of human genetics based on pedigree material cannot accomplish this objective. On the contrary, they confuse the essential difficulties of interpretation for the good enough reason that the human family is the medium for transmitting a physical regimen and a social tradition no less than an assemblage of genes.

In every phase of medical instruction, the nature-nurture dichotomy is supremely relevant; but nowhere, unless it be in a department of social medicine, is there a niche where the student may make at least a nodding acquaintance with population genetics in its bearing on selection, inbreeding, and the break-up of population isolates. There are many who regard the topic as unapproachably remote in the empyrean of mathematical facility. For my part, I hold that it is possible to bring all the major themes of population genetics to earth by recourse to visual models. In a preliminary way, I pointed out

the possiblity of doing so in my Wisconsin lectures published as *An Introduction to Mathematical Genetics*. At a far simpler level, I have indicated other possibilities in the thirteenth chapter of my recently published treatise *Statistical Theory*.

Repeat Performance

Evidence that a wave of Asian flu swept the United States 70 years ago has been reported by researchers at The University of Michigan Medical Center. The finding opens the possibility for making a single vaccine to protect against all forms of influenza.

The announcement was made by Dr. Fred M. Davenport, associate professor of epidemiology and of internal medicine at the university. The research was supported by the Armed Forces Epidemiological Board.

The worldwide outbreak of Asian flu was interpreted by some to support a theory, now disproved, that an infinite variety of flu strains might attack mankind. Narrowing the field to only four strains is a major step toward eliminating influenza as a public health hazard.

The Cost of Medical Education: A Pilot Study

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OVER THE PAST 10 years, many statements have been made about the high cost of medical education, both to students and to educational institutions. Frequently, such statements continue with the lament that little reliable, comparable information on medical education exists.[1]

The assembling of comparable data on medical school expenditures is not a simple task because of differences among the individual schools in such factors as organization, curriculums, numbers and kinds of students, proportion of full-time faculty, emphasis on research, and relationships with teaching hospitals. Despite these difficulties, the need for reliable cost information has been emphasized repeatedly as particularly important for procuring adequate financial support for medical education programs. Even though the development of a uniform costing process applicable to all schools may require considerable time, the appropriate study of costs in individual schools can lead to a better understanding of their financial structure and can pave the way for more extensive studies involving schools with varying patterns of organization.

The report of a study on Medical School Grants and Finances[1] published by the Public Health Service in 1951, which was based on data received from the individual medical schools, points up many of the problems of comparing costs among different schools. Although a "basic operating expense unit" was defined, the report recognizes that the data include an undetermined amount of expense for functions other than the teaching of undergraduate medical students, such as the teaching of non medical students, research activities and patient care. On the other hand, some expenditures are omitted that may include some truly medical education expense, such as expenditures of university academic units other than the medical school, university hospitals, and organized research. Clearly, a method is needed for isolating the expenditures of these various functions of a medical school.

Such a functional classification of expenditures was the goal of a study undertaken jointly by the Emory University School of Medicine and the U. S. Public Health Service. This was a pilot project designed to serve two general purposes: (a) to provide

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the school of medicine with information on medical education expenditures that would be more accurate than the university had had previously; and (b) to develop basic concepts and methods for analyzing costs of medical education that might be useful to other schools.

With these objectives in mind, a Cost Study Committee was appointed consisting of eight persons from the administrative and academic staffs of Emory University and a representative of the Public Health Service.[1] This group decided on the scope of the study and, in general, on the methods to be used. The basic asumptions which must be kept in mind in interpreting the results of the study may be summarized as follows:

1. The study would be limited to an analysis of the expenditures recorded in the Emory University accounts. This limitation means that any evaluation of services contributed by the voluntary staff or outside agencies would be *excluded* from the expenditures as shown. This limitation was decided on as an expediency—until the more basic problems of analysis had been defined and solutions developed in later studies. To the extent that voluntary services are used in the medical education program, the costs shown in this study are understated.

2. Expenditures for the "medical education program" would include, in addition to the total expenditures of the School of Medicine, a part of the expenditures of other units of the university which are attributable to medical education. The total medical education program's expenditures would be divided among the following major functions:

Undergraduate medical instruction
House staff instruction
Postgraduate medical education
Nonmedical instruction
Departmental research
Organized (separately budgeted) research
Patient care
Community services

3. The basis for this functional division would be the distribution of personnel time and of nonpersonnel expenditures among the various functions listed above as estimated by the heads of the academic departments.

4. The interrelationship between undergraduate medical instruction and other major functions, such as research and patient care, would be explored with a view to determining the total university cost per undergraduate medical student.

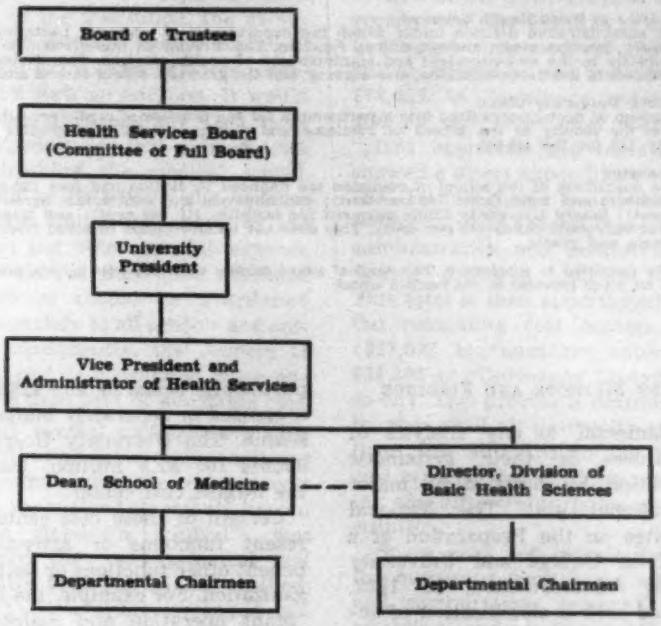
[1] The authors of this article constituted the Study Staff.

Profile of Emory University School of Medicine

In order to understand the procedures used and the findings from this study, a brief description of the setting and organizational pattern of Emory University is essential.

I. Emory University
  A. Location: Just outside the city limits of Atlanta, Georgia, in the Druid Hills section. Post office and railroad station: Emory University, Georgia.
  B. Ownership and Operation: Owned by the Methodist Church and operated by a Board of Trustees under their authority.
  C. Divisions of the university:
    1. School of Business Administration
    2. College of Arts and Sciences
      a. Main Campus
      b. Emory-at-Oxford
    3. School of Nursing
    4. School of Dentistry
    5. Graduate School of Arts and Sciences
    6. School of Law
    7. School of Medicine
    8. School of Theology

II. School of Medicine Organization Chart


Board of Trustees
Health Services Board (Committee of Full Board)
University President
Vice President and Administrator of Health Services
Dean, School of Medicine
Director, Division of Basic Health Sciences
Departmental Chairmen
Departmental Chairmen

III. Number of Undergraduate Medical Students
Seventy-two per class for a total of 288.

IV. Number of Faculty (professors, associate professors, assistant professors, associates and instructors)

Status	Division of Basic Health Sciences	School of Medicine
Full-time	38	16
Geographic full-time*	—	24
Part-time	4	27
Voluntary	—	359
Total	42	426

* See footnote [2].

V. Affiliated Hospitals

A. Grady Memorial Hospital. A charity hospital with 700 beds operated by the Fulton-DeKalb Hospital Authority. Staff composed of members of Emory University School of Medicine faculty.

B. Emory University Hospital. A private hospital, owned and operated by Emory University, with 330 beds. All staff members are also members of the Emory University School of Medicine faculty. Radiology and pathology services purchased from Emory University School of Medicine.

C. Veterans Administration Hospital. A 300-bed hospital operated by the Veterans Administration and staffed by a Dean's Committee of the Emory University School of Medicine. Consultation fees paid to faculty members were not considered in this study.

VI. Division of Basic Health Sciences
An administrative division under which the departments of anatomy, bacteriology, biochemistry, pharmacology, and physiology function. The director of this division is responsible directly to the vice-president and administrator of health services. This division serves the schools of dentistry, medicine, and nursing, and the graduate school of arts and sciences.

VII. Emory University Clinic
A group of doctors organized into a partnership for the practice of medicine. All members are on the faculty of the school of medicine and thus provide the geographic full-time faculty [2] for the school.

VIII. Financing
The operations of the school of medicine are financed by tuition and fees (23 per cent); endowments and trust funds (40 per cent); contributions and contractual agreements (15 per cent); Emory University Clinic payment for facilities (10 per cent); and transfer from general University funds (12 per cent). This does not include funds received from research contracts and grants.

[2] Faculty permitted to supplement their medical school salaries with fees from private practice conducted in an office provided at the medical school.

Study Methods and Findings

Fundamental to any analysis of expenditures is their systematic classification by function or major organizational unit. The National Committee on the Preparation of a Manual on College and University Business Administration, in 1952, published such a classification of accounts.[1] Each functional or organizational unit for which expenditures are segregated is known as a "cost center." With this classification of accounts used as a basis, the total expenditures [3] of Emory University, amounting to $9,271,110, were grouped into seventeen major cost centers. The expenditures that can be readily identified as being related to a particular function or organizational unit (that is, the direct expenditures) were distributed among these cost centers as shown in the first line across Table 1. This table shows that the direct expenditures for the School of Medicine amount to $667,112 for instruction and departmental research, and $283,627 for organized or separately budgeted research. The University Hospital accounts for $2.5 million, making it the largest cost center.

Certain of these cost centers represent functions or activities that benefit other functions or units of organization. For example, the function "plant operation and maintenance" exists to provide services to the various educational programs of the university. In terms of the educational programs, the expenditures for operation and maintenance are *indirect* or *overhead* costs, which must in some way be divided and added to the direct expenditures of the educational programs. The allocation of indirect costs on an equitable basis is, therefore, an important element in cost analysis.

The method of allocation employed in this study was based on the concept of average cost—the cost of a given service during a specified period of time apportioned among the number of units served. The concept of average cost was considered more appropriate than the avoidable cost concept which represents merely the additional cost involved by the addition of a particular function or pro-

[3] In order to derive equitable apportionment of overhead expenditures (for example, general administration and institutional expense), it was necessary to consider the total expenditures of the university, including those of the University Hospital, and expenditures from grants, contracts, and special purpose funds.

gram. If, for example, a university decides to establish a medical school as part of the institution, the avoidable cost method would represent only the extra expenditures occasioned by such an addition. It would not include a share of any fixed overhead expenditures that existed prior to establishing the medical school. Inasmuch as all schools and colleges of Emory University share in the overhead and other general services, it was believed that these overhead expenditures should be distributed proportionately to all schools and colleges. Consequently, the concept of average cost is considered more appropriate than that of avoidable cost.

Of the several methods available for distributing indirect expenditures in accordance with the average cost concept, the method commonly known as "the stepdown method"[1] was considered the most practical and sufficiently accurate. In this method, the cost centers are arranged according to the amount of services they render to other cost centers. Those rendering the greatest service to other cost centers, in proportion to services received, appear first in the arrangement. Those rendering the least service to others appear last. Beginning with the first cost center, its expenditures are apportioned to each of the subsequent cost centers it serves. Once this is done, the account for this cost center is closed; nothing more is added to it or deducted from it. This apportionment process is repeated in turn for each of the other cost centers.

This "stepdown" process of apportionment is illustrated in Table 1, and the bases for apportionment are explained in a subsequent section. For example, Emory University expended $515,198 for "general administration and institutional expense." This functional unit provides services to most of the other units of the university, and the $515,198 is allocated to the cost centers served ($36,091 to "plant operation and maintenance," $78,025 to "auxiliary enterprises," and so on). The next cost center "plant operation and maintenance" showed a direct expenditure of $517,769. To this figure is added the apportionment of $36,091 from "general administration and institutional expense," giving a total of $553,860. This total is then apportioned among the remaining cost centers served ($27,023 to "auxiliary enterprises," $34,206 to "University Library," and so on). This process is continued step by step until all university expenditures are allocated to the primary cost centers, that is, those representing the ultimate purposes of the institution.

Space does not permit describing the numerous worksheets, schedules, and computations required for assembling and analyzing the data. The Study Staff made a detailed report to the Emory Study Committee. Readers interested in the details or in the derivation of specific figures may request copies of the complete report from the Dean, School of Medicine, Emory University.

Apportionment Procedures

The bases used for the apportionment of the total expenditures differ from one cost center to another, depending on the nature of the expenditures. In allocating the expenditures of some individual cost centers, consideration must also be given to any differences among the items to which the expenditures are allocated. For example, the university hospital provides more of its own administrative services than do the schools and colleges, hence its allocation of the university's general administrative

TABELE 1
Summary of University xpenditures and Their Distributions

Item	General administration and institutional expense	Plant operation and maintenance	Auxiliary enterprises	University library	Student aid	Student services	Vice President and Administrator of Health Services
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. Direct expenditures, total	$515,198	$517,760	$1,119,460	$169,553	$327,174	$302,309	$17,128
2. Allocated charges:							
General administration and institutional expense	$515,198	36,091	78,025	11,827	—	18,281	—
Plant operation and maintenance		$553,860	27,023	34,206	—	60,781	—
Auxiliary enterprises			$1,224,508	—	—	—	—
University library				$215,586	—	—	—
Student aid					$327,174	—	—
Student services						$341,461	—
Vice President and Administrator of Health Services							$17,128
Emory University Hospital							
Division of Basic Health Sciences							
School of Medicine							
3. Transfers†							
4. Unallocated	—	—	$1,224,508	—	$327,174	—	—
General administration and institutional expense	100.0	7.0	15.1	2.3	—	3.6	—
Plant operation and maintenance		100.0	4.9	6.2	—	11.0	—
Auxiliary enterprises			100.0	—	—	—	—
University library				100.0	—	—	—
Student aid					100.0	—	—
Student services						100.0	—
Vice President and Administrator of Health Services							100.0
Emory University Hospital							
Division of Basic Health Sciences							
School of Medicine							
Transfers							

*Adjusted to avoid charging for services which do not pertain to these cost centers.
†Represents both direct and indirect expenditures for radiology and pathology services provided to the hospital.
‡Less than 0.05 per cent.

Emory University Hospital	Units of Instruction and Departmental Research				Organized Research			Emory University Clinic	Extension and Public Services	Total
	Division of Basic Health Sciences	School of Medicine	Emory at Oxford	Other	Division of Basic Health Sciences	School of Medicine	Other			
(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
$2,529,862	$352,226	$ 667,112	$173,240	$1,920,549	$275,962	$283,627	$107,024	—	$32,717	$9,271,110
107,054*	24,566	46,481	10,257*	133,887	19,247	19,770	7,450	—	2,262	
1,294	75,115	108,368	79	246,620	148	152	57	—	17	
—	—	—	—	—	—	—	—	—	—	
—	—	—	—	215,586	—	—	—	—	—	
—	—	—	—	—	—	—	—	—	—	
—	—	35,853	—	305,608	—	—	—	—	—	
2,447	2,447	2,447	—	4,893	2,447	2,447	—	—	—	
$ 2,640,657	1,718	11,151	—	27,238	—	—	—	$34,080	2,199	
	$456,172	137,953	—	145,337	134,092	—	—	—	18,334	
		$1,029,365	—	32,018	13,594	92,677	180	13,764	31,355	
			$183,576	$3,031,736	$445,420	$398,673	$114,721	$47,844	$86,884	
94,889†		(94,889†)								
$2,735,546	$456,172	$934,476	$183,576	$3,031,736	$445,420	$398,673	$114,721	$47,844	$86,884	
$2,659,160	$ 456	$750,958	$183,576	$3,031,736	$445,420	$398,673	$114,721	$47,844	$86,884	$9,271,110
Percentage Distribution of Allocations										Unallocated
20.8	4.8	9.0	2.0	26.0	3.7	3.8	1.5	—	0.4	—
0.2	13.6	19.6	‡	44.5	‡	‡	‡	—	‡	—
—	—	—	—	—	—	—	—	—	—	100.0
—	—	—	—	100.0	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	100.0
—	—	10.5	—	89.5	—	—	—	—	—	—
14.3	14.3	14.3	—	28.5	14.3	14.3	—	—	—	—
100.0	0.1	0.4	—	1.0	—	—	—	1.2	0.1	97.2
	100.0	34.6	—	31.9	20.4	—	—	—	4.0	0.1
		100.0	—	3.1	1.3	9.0	‡	1.3	3.1	73.0
9.2		(9.2)								

expenditures is relatively less than in the case of the schools and colleges. In general, however, the bases for apportionment are as follows:

Cost center	Basis for apportionment
General administration and institutional expense	Percentage distribution of direct expenditures of all other cost centers.
Plant operation and maintenance	Some charges included in direct expenditures of cost centers. Other known charges based on service units allocated directly to buildings. Remaining Operation and Maintenance expenditures apportioned among buildings on gross square foot basis and then to cost centers within buildings on the basis of square footage of occupancy.
Auxiliary enterprises	Not apportioned.
University Library	All apportioned to Other Units of Instruction and Departmental Research.
Student aid	Not apportioned.
Student services	Student enrollment.
Vice President and Administrator of Health Services	Apportioned equally among: School of Medicine; Division of Basic Health Sciences; School of Dentistry; School of Nursing; Organized Research—School of Medicine; Organized Research—Division of Basic Health Sciences; Emory University Hospital.
Emory University Hospital	Apportionment bases similar to those employed in the case of the University. Apportionment to School of Medicine consists of charges for space and for resident services to undergraduate medical teaching.
Division of Basic Health Sciences	Apportionment bases by department similar to those employed in the case of the University. Apportionment by function based on conferences with department heads. Personnel expenditures distributed on time estimates. Basis for distributing nonpersonnel expenditures varied with department.
School of Medicine	Same as Division of Basic Health Sciences in general, with following exceptions: Medical library—distribution to research based on ratio of research to general operating expenditures; distribution to instruction and other functions based on sample survey of usage. Pathology—time for teaching research, and service; service reapportioned to hospital and other units on basis of tissue slides prepared.
Organized Research Division of Basic Health Sciences School of Medicine	All grants, contracts, and special purpose funds considered under organized research but distribution of funds according to activity based on conferences with department heads.

Medical Education Program Expenditures

The total expenditures of Emory University for the medical education program amounted to $1,561,691, exclusive of the value of voluntary personal services and of any services provided by affiliated hospitals other than Emory University Hospital. This amount consists of the direct and indirect expenditures of the school of medicine (including its grants, contracts, and special purpose funds); a share of the same type of funds attributable to medical education and expended by the Division of Basic Health Sciences; and a small share of Emory University Hospital expenditures (Table 2).

The expenditures of the School of Medicine include those for nonmedical instruction, research, patient care, and community services as well as the expenditures for strictly medical instruction.

Of the total expenditures of the division of basic health sciences, only a portion is applicable to the medical

TABLE 2

Summary of Expenditures, Medical Education Program

School of Medicine		
1. General Funds:		
Direct expenditures		$ 667,112
Indirect expenditures		
University general administration and institutional expense	$ 46,481	
Plant operation and maintenance	106,368	
Student services	35,853	
Administrator of Health Services	2,447	193,149
2. Grants, Contracts, and Special Purpose Funds:		
Direct expenditures		283,627
Indirect expenditures		
University general administration and institutional expense	$ 19,770	
Plant operation and maintenance	152	
Administrator of Health Services	2,447	22,369
Subtotal		$1,166,257
Division of Basic Health Sciences		
3. General Funds:		
a. For medical teaching:		
Direct expenditures		37,222
Indirect expenditures		120,731
b. For proportionate share of research to support medical teaching:		
Direct expenditures		51,755
Indirect expenditures		18,164
4. Grants, Contracts, and Special Purpose Funds:		
a. For medical teaching:		
Direct expenditures:		16,139
Indirect expenditures		1,135
b. For proportionate share of research to support medical teaching:		
Direct expenditures		128,780
Indirect expenditures		10,357
Subtotal		$ 384,283
Emory University Hospital		
5. General Funds		
Direct and indirect expenditures		$ 11,151
Total		$1,561,691

education program, since the division serves the Schools of Dentistry and Nursing and the Graduate School as well as the School of Medicine.

The division of the $1,561,691 total medical education program expenditures among the major activities[4] was based on estimates of personnel time distributions and of the utilization of nonpersonnel funds. These estimates were provided by each department head in the School of Medicine and the Division of Basic Health Sciences in conference with a representative of the study staff, accompanied by the Dean of the School or the Director of the Division. Each conference was summarized in writing and returned to the department head for review.

Divided on the basis of these estimates, the total medical education program expenditures appear in Table 3.

Undergraduate medical instruction.—The 30 per cent shown in Table 3 as undergraduate medical instruction represents the cost of only those activities that are directly related to undergraduate medical instruction. Some of the other listed activities are, however, essential to the successful conduct of undergraduate medical education, and, therefore, portions of the other expenditures should be added to arrive at the full cost of educating a medical student. Consequently, each of the remaining items will be discussed with this fact in mind and the effect of alternative proposals on the cost per student will be shown in Table 4.

House staff instruction.—The medical school faculty at Emory University considers that the house staff carries much of the work load of teaching the undergraduate medical students. Without a well prepared house staff, the faculty would be unable to fulfill the teaching demands. Moreover, if undergraduate medical students are to have an appropriate setting and adequate clinical material, the faculty must usually accept full responsibility for all professional care in certain hospital services including responsibility for house staff instruction and supervision. From this point of view, therefore, one might consider that the entire cost of house staff instruction should be charged to the undergraduate program.

From another point of view, house staff instruction may be considered an end in itself, separate and apart from the undergraduate program. The intern or resident accepts his appointment for the prime purpose of gaining experience in the care of patients and for self improvement. He probably considers teaching a minor or secondary function. Even if the school did not rely on the house staff for teaching services, it probably would feel a moral responsibility for the proper training of interns and residents. Under these circumstances, expenditures for house staff education would represent the cost of a separate, distinct function, and very little or none of this cost would be charged to the undergraduate program.

Perhaps the more reasonable ground between these two extremes is to charge to the undergraduate program only that portion of the house staff instruction that represents benefits to the undergraduate program. On the basis of the information available, it seems probable that in the Emory setting about 20 per cent of the house staff time is spent in the teaching and supervision of medical students and therefore,

[4] The major activities of the medical education program: Undergraduate medical instruction, house staff instruction, postgraduate education, nonmedical instruction, departmental research, organized research, patient care, and community services.

TABLE 3

Distribution of Total Expenditure according to Activities within the Medical Education Program

Activity	General funds		Grants, contracts, and special purpose funds				All funds	
	Amount	Per cent	Division of Basic Health Sciences		School of Medicine		Amount	Per cent
			Amount	Per cent	Amount	Per cent		
Instruction								
Undergraduate medical	$ 407,304	37.1	$ 14,190	9.1	$ 49,118	16.1	$ 470,612	30.1
House staff	189,570	17.2	3,084	2.0	33,902	11.1	226,556	14.5
Postgraduate medical	10,164	0.9	—	—	3,448	1.1	13,612	0.9
Nonmedical	32,018	2.9	—	—	3,134	1.0	35,152	2.2
Departmental Research								
Division of Basic Health Sciences	179	*	—	—	—	—	179	*
School of Medicine	8,802	0.8	—	—	—	—	8,802	0.6
Organized Research								
Division of Basic Health Sciences	69,740	6.3	139,137	88.9	—	—	208,877	13.3
School of Medicine	92,677	8.4	—	—	130,011	42.5	222,688	14.3
School of Medicine Library								
Basic Health Science medical research	7,168	0.7	—	—	—	—	7,168	0.5
Basic Health Science other research	6,356	0.6	—	—	—	—	6,356	0.4
School of Dentistry research	180	*	—	—	—	—	180	*
Patient Care								
Radiology service to E. U. Hospital	41,954	3.8	—	—	—	—	41,954	2.7
Pathology service to E. U. Hospital	52,935	4.8	—	—	8,901	2.9	61,836	4.0
Services to E. U. Clinic	13,764	1.3	—	—	5,941	1.9	19,705	1.3
Professional care of patients	135,118	12.3	—	—	70,060	22.9	205,178	13.1
Community services	31,355	2.9	—	—	1,481	0.5	32,836	2.1
Total	$1,099,284	100.0	$156,411	100.0	$305,996	100.0	$1,561,691	100.0

* Less than 0.05 percent.

TABLE 4
Expenditure per Undergraduate Medical Student

Purpose of expenditure	Amount of expenditure	Number of students	Unit of expenditure	Expenditure per student according to concept*					
				A	B	C	D	E	F
Undergraduate medical instruction	$470,612	287	$1,640	$1,640	$1,640	$1,640	$1,640	$1,640	$1,640
House staff instruction									
Total expenditure	226,556	287	789	789	789	—	—	—	—
20 percent of total expenditure†	45,311	287	158	—	—	158	158	—	—
Research									
General and grant funds	282,508	287	984	984	—	984	—	984	—
General funds only	126,037	287	439	—	439	—	439	—	439
Patient care									
Expenditures chargeable to undergraduate program	102,589	287	357	357	357	357	357	357	357
Total expenditure per undergraduate student	—	—	—	$3,770	$3,225	$3,139	$2,594	$2,981	$2,436

* Alternative concepts:
A = All house staff instruction; all research funds.
B = All house staff instruction; research, general funds only.
C = 20 percent house staff instruction; all research funds.
D = 20 percent house staff instruction; research, general funds only.
E = No house staff instruction; all research funds.
F = No house staff instruction; research, general funds only.

† Assumed proportion chargeable to undergraduate program.

perhaps, 20 per cent of the expenditures for house staff instruction should be included in the cost of the undergraduate program.

Postgraduate and nonmedical instruction.—These activities are not directly related to the teaching of medical students at Emory University and consequently expenditures for these programs are not considered a part of undergraduate medical education expenditure.

Departmental and organized research.—The expenditures shown in Table 3 for research—departmental and organized—total $454,250. This amount includes direct and indirect expenditures specifically for research and coming from the general funds and grant funds of both the School of Medicine and the Division of Basic Health Sciences. The amount from the division of Basic Health Sciences ($216,224) represents only that portion of its research expenditures considered to be in support of medical education as distinguished from nonmedical education. This portion is based on a percentage distribution of expenditures for instruction in the medical and nonmedical fields in the Division of Basic Health Sciences. In the case of both the Medical School and the Division of Basic Health Sciences, not all personnel paid from grant funds spend their entire time on research. Some assist with teaching or, in the course of carrying out their research, provide considerable care to patients. Consequently, only that portion of their salaries estimated as being spent directly on research is included in this figure—plus, of course, a proportionate share of indirect expense.

Although medical educators generally agree that research is essential to good teaching, the question is how much of the total research expenditure should be charged to the educational program? Some believe that, if research and teaching are closely integrated, all research expenditures, both departmental and organized, should be included in the instructional costs. According to this point of view, grant funds for organized research would probably be included, inasmuch as they support research objectives originating within the school, not with the agency that provides the grant support. Furthermore, without such grant funds, some departments would be unable to carry on any significant amount of research—to the detriment of the teaching program. If this point of view should prevail, then all research expenditures ($454,250) would be divided among the several instructional programs—undergraduate, house staff, postgraduate, and nonmedical—possibly in proportion to the expenditures for instruction in each. On this basis, $282,508 would be charged to undergraduate medical instruction.

A second point of view on the relationship of research to teaching is that only research expenditures coming from the university's general funds should be considered as part of the educational costs. Research grants in the final analysis represent support in behalf of special, national programs sponsored outside the school and are not necessarily part of the educational program. In the absence of grant support, the University would undoubtedly spend some of its general funds for departmental research in medicine and the basic health sciences. Such funds, as distinguished from research grant monies, would be considered as an integral part of and properly chargeable to the educational program. According to this point of view, only $206,278 or 45 per cent of the total re-

search expenditures at Emory would be divided among the instructional programs. Of this amount, $126,037 would be charged to undergraduate medical instruction.

Patient care.—Under the general heading of patient care, the expenditures at Emory University consist of four items (see Table 3)—radiology services to Emory University Hospital, pathology services to the University Hospital, services to Emory University Clinic, and professional care of patients. The first three items are in part covered by fees paid to the Medical School by the Hospital or Clinic. Some educators might consider that the provision of these services (x-rays, autopsies, and tissue slides) strengthen the academic departments by adding to their practical experience and, therefore, indirectly benefits the teaching program. According to this concept, the difference between the cost of providing such services and the fees received would be charged to the teaching program. However, most educators would probably agree that expenditures for these kinds of services should be recovered from those that benefit directly or from special funds obtained specifically for these purposes and, therefore, should not be considered a part of the undergraduate expenditures.

The last item, professional care of patients, represents primarily the cost of estimated time devoted to medical care provided on the teaching services, mostly at Grady Hospital, by paid members of the faculty and research staffs in six clinical departments—medicine, obstetrics and gynecology, ophthalmology, pediatrics, psychiatry, and surgery. The medical school receives no cash reimbursement for these services. Medical school faculties frequently accept the full responsibility for medical care on teaching services to assure an adequate number and variety of patients and the maintenance of high standards of care. These assurances are essential to a good teaching program for both undergraduate students and house staff. If, then, the school must accept responsibility for patient care in order to assure good teaching material, it is reasonable to assume that, in the absence of any reimbursement, the total expenditures for professional services to patients are a legitimate part of educational costs.

The availability of patients and the need of faculty supervision for their care are equally essential to the proper training and experience of the house staff and to the teaching of junior and senior medical students. Therefore, it seems reasonable to assume that expenditures for patient care in the six clinical departments should be charged to both house staff and undergraduate instruction. If the division of expenditures is based on the number of persons benefiting, the house staffs at Grady and Emory numbering about 150 would be charged with 52 per cent of the cost, and the undergraduates consisting of 141 junior and senior students would be charged with 48 per cent. If direct expenditures for faculty salaries allocated to the two types of instruction in the six clinical departments are used as an index of the time and effort devoted to each, the order of the percentages would be reversed—45 per cent and 55 per cent. An equal division of this item of expenditure between house staff instruction and undergraduate medical instruction, therefore, seems reasonable.

Community services.—The expenditures for community services is the final item of the medical educa-

tion program as shown in Table 3. This activity represents medical library services to outside professional persons, professional services rendered to community clinics and to governmental and national voluntary agencies, and informational services to the press. Although these services have a public relations value to the university, they are not ordinarily considered as an integral part of the teaching program. Consequently, the expenditures for such services are not included in the cost of education.

Expenditure Per Undergraduate Medical Student

The foregoing discussion has attempted to outline briefly, different views on the relationships of the various segments of the total medical education program expenditures to the expenditures for undergraduate medical instruction. The eventual goal is to determine the cost of educating a medical student at Emory University. This cost will vary depending on one's concepts of the relationships of house staff, research, and patient care to undergraduate medical teaching. Based on these varying concepts, Table 4 presents several answers depending on the combination of concepts accepted.

Of the several concepts presented in Table 4, the Emory Medical Education Cost Study Committee considered that the most realistic unit expenditure includes, in addition to the expenditures for undergraduate medical instruction, a portion of the expenditures for house staff instruction, a proportionate share of expenditures from general funds for research, and a portion of the expenditures for professional care of patients. Concept D in Table 4 meets these specifications. On this basis, the average annual expenditure per undergraduate medical student, *exclusive of any value of services contributed by the voluntary staff*, was considered to be approximately $2,600.

Summary and Conclusions

A pilot study of medical education was undertaken jointly by Emory University and the Public Health Service to explore concepts and methods essential to determination of the cost of medical education, particularly in the undergraduate field. As indicated by a number of writers over the past 10 years, cost data are fundamental to an understanding of the financial structure of medical education and to obtaining adequate financial support.

The method developed in this study, which was limited to expenditures shown in the university accounts, was based on the average cost concept in which overhead and related expenditures are allocated to the medical education program and to other schools and departments in proportion to the services rendered to each. The average cost concept was also utilized to distribute the medical education expenditures among the several functions within the program — undergraduate instruction, house staff instruction, nonmedical instruction, research, patient care, and community services. The interrelationships between undergraduate medical education and other program activities as they affected undergraduate costs were explored and conclusions developed.

Expenditures per student for undergraduate medical education, exclusive of the value of services contributed by the voluntary staff, were found under the terms of this project, to range from approximately

$2,400 to $3,800, depending upon one's concept of the interrelationships between undergraduate education, research, house staff instruction, and patient care. Within this range, the Committee selected the provisional figure of $2,600 as being the most reasonable. This figure includes a part of the cost of house staff instruction, representing the contribution of the house staff to the teaching program; a part of expenditures for patient care; and a proportion of the expenditures from the university's general funds for medical research—all in addition to the expense of activities directly related to undergraduate instruction. Expenditures for the teaching of nonmedical students, for grant supported research, and for certain community and patient care services were not considered a part of the undergraduate expenditures.

Following a comprehensive review of the method and findings, the Committee concluded that a study of this type, in which expenditures are analyzed in accordance with functional activities, provides more revealing and useful information than do analyses based on organizational lines. However, the Committee emphasized the exploratory nature of this study and indicated the desirability of a much broader project in which several universities and their schools of medicine, representing different patterns of organization and control, would participate. The goal of such a project might well be the development of principles, systems of accounting, and methods of expenditure analysis that would meet the needs for reasonably uniform cost information in medical education programs. Although the study as here outlined is regarded only as a pilot undertaking, it could serve as a basis for further development of appropriate methods.

REFERENCES

1. Because of space limitations, references have been omitted. The authors will provide them on request.

Editor's Note: It has been brought to our attention that the invocation from the Rig Veda-X.191.2-4, which appeared at the close of Dr. C. G. Pandit's article in the March issue, was printed upside down. We herewith print it correctly.

समानी व आकूतिस्समाना हृदयानि वः ।
समानमस्तु वो मनो यथा वस्सुसहासति ।।

The Role of a Research Institute in a Medical School*

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RESEARCH INSTITUTES associated with medical schools are often regarded as ancillary appendages whose personnel enjoy certain advantages over their colleagues in other departments. Since the staff members of such institutions are not burdened with the teaching of general courses and can devote their full efforts to investigations, there is a general feeling that they enjoy an unfair advantage over the teaching faculty—especially since productivity in research is one of the main criteria for promotion, both in salary and in rank.

While such a situation undoubtedly exists at some medical schools, this need not necessarily be the case. In the first place, for decisions concerning promotions, there should be no distinction between outstanding ability in teaching and outstanding productivity in research. Secondly, research institutions associated with medical schools should assume a greater share of responsibility for the teaching load, and there is a special area of teaching in which such institutions can and should play a key role. It is this activity which will be considered here. I am referring to the training of graduate and post-doctoral students for medical research.

The training of people for medical research is becoming increasingly important. The need for persons adequately trained to conduct such research is growing every year. We can expect this need to continue to increase as the advances resulting from present research stimulate still other investigations at an ever increasing pace and as private and government agencies continue each year to increase the funds for medical research. Various departments in medical schools have done an excellent job in training students for research, but the need for such trained individuals still greatly exceeds the supply. Research institutes associated with medical schools can and should assist with such training.

Years ago the techniques required for many research problems were learned as part of the regular classwork, and many graduates of medical schools conducted some research without additional training. Today, however, few problems remain that can be solved by the individual who has not had the benefit of additional training. The proper preparation for such background consists of two components: first, an apprenticeship with someone engaged in research and, second, training in certain basic subjects and methodology.

The research institute is ideally

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suited to provide the first of these two requirements for training, since its key investigators are actively engaged in research and can offer the close guidance imperative for such a task. In addition, their rich experience and accomplishments in research provide the stimulation vital to all successful teaching. Thus, in certain cases the investigators in institutions are better able to offer training in research than some of their colleagues in departments that are already overburdened with the teaching of medical students.

It is obvious that teachers must possess more than a brief and superficial experience in research if students are to obtain a good training in this field. If the teacher lacks such experience, the student who started with great hopes and expectations soon becomes dissatisfied and disillusioned; the result is that he is either poorly trained or lost to research.

However, even though an institute may have competent teachers, its role in graduate teaching is dependent upon its physical and administrative association with a medical school and university. If it is to assume such responsibility, it should preferably be located on a university campus where basic courses at the graduate level are offered in the physical and biological sciences. A similar close association is also desirable when the training is at the postdoctoral level, so that the student may audit courses and thereby refresh and strengthen his understanding of a subject.

The second important component for a background in research is the adequate preparation in basic subjects. It is essential to obtain broad training in a given field, whether it be biochemical, physiological, or morphological. The satisfactory completion of the basic science courses ordinarily offered by medical schools cannot suffice for such fundamental training. Adequate background can be obtained only by further training in chemistry, physics, mathematics, genetics, cytochemistry, or any other subject which will help to provide a firm foundation in the area selected by the student. If the training is sufficiently broad and fundamental, the students should be able to apply their knowledge and techniques to almost any disease entity and to work in numerous related fields. In other words, the student should not be trained merely as a technician for a specific job, but in all those fundamentals which make an independent research investigator. In my opinion, the Ph.D. degree should not be granted to persons who have completed their medical course and who have had, in addition, 2 or 3 years of acquaintance with some aspect of research without, however, taking additional fundamental course work. A number of principles comprise a good training program.

1. The course curriculum must be planned with the same care as the curriculum for medical students and must consist of solid, fundamental courses in the required subjects. The basic science courses required of all medical students will usually not suffice for this purpose.

2. Each student must receive individual training in the methodology of research.

3. Each student must be taught individually how to formulate reasonable experiments in a given research problem.

4. Each student must be taught what the limitations of the methods are, so that he can predetermine

whether a proposed experiment or problem can or cannot be readily pursued with the available techniques.

5. Each student must be taught critical analysis, which is essential for all research.

6. Finally, each student must be trained to present his work both orally, at scientific meetings, and in written form, for publication.

A training program which incorporates these principles is not, of course, limited to research institutes, and various examples could be cited to indicate the effectiveness of such a training program. Because I am most familiar with the McArdle Memorial Laboratory, of which I am the director, I shall use it as an example. By this I do not intend to imply that this is a model—I wish only to illustrate with a few specific facts what a relatively small research institute can do by way of training graduate and postdoctoral students for medical research.

The McArdle Laboratory was set up 17 years ago to do cancer research. It grew slowly over the years, so that at present it includes eight faculty members with ranks of assistant to full professor in the medical school. At present, there are approximately 25 postdoctoral students, eighteen graduate students, and other technical assistants to make a total staff of about 80. Our institution is organized as a family unit, and it is our intention to keep the organization quite small, so that each faculty member can be familiar with the progress of others in the laboratory. We feel that this close association is conducive to research, and we have resisted the tendency to increase greatly in size. We do not attempt to cover all aspects of the cancer problem but have limited our attack to certain fundamental approaches to the biochemistry of cancer metabolism and carcinogenesis.

Since the beginning, our graduate training program has been strictly limited so that the number of students for each faculty member would not exceed a total of six students, usually divided equally between graduate and postdoctoral students. Only by such limitations, we believe, can a teacher have close, stimulating contact with each student without becoming so involved in the direction of students that he no longer has sufficient time to think about his whole research program. If the number of students becomes too great, then the very quality for which the faculty member was hired—namely, his research capability—will be buried under administrative duties, and the time necessary to maintain contact with the latest advances in the field and to pursue creative research will be lost.

Up to the present time, twenty persons have earned a Ph.D. degree in our department. Half of these are now engaged in teaching and research, primarily in medical schools. As can be seen from Table 1, they are in various departments—biochemistry, chemisty, oncology, and pharmacology. The other half of these students now have full-time research positions—with the National Institutes of Health; with research laboratories in medical schools or hospitals, such as the Massachusetts General Hospital; with the Argonne National Laboratory, Worcester Foundation, etc. This list does not include the eighteen graduate students now in various stages of training. In addition to the Ph.D. graduates, ten other students received their M.S. degree with us who did not continue towards the Ph.D. at the McArdle Laboratory.

TABLE 1

PRESENT POSITIONS OF RECIPIENTS OF PH.D. DEGREE AT McARDLE MEMORIAL LABORATORY

TEACHING AND RESEARCH	
Departmental affiliations:	
Biochemistry	2
Chemistry	3
Oncology	1
Pharmacology	4
Subtotal	10
FULL-TIME RESEARCH	
Laboratories at medical schools or hospitals	5
Special research institutions	5
Subtotal	10
TOTAL	20

Perhaps the greatest contribution of research institutions to training for research is at the postdoctoral level. This period is especially important in that it provides additional experience and seasoning and represents a transition from student days to the time when one must carry on a wholly independent research program. It is that rare period in life when one can devote all his working time to intellectual gain without the earlier concerns of the graduate student and without the responsibilities which accrue with more permanent positions.

Of the 57 postdoctoral fellows who have received additional training at McArdle, the majority has remained with us for 2 years, with a few staying for only 1 year and an occasional one for 3. Twenty-five of these are now engaged in teaching and research. As is apparent from Table 2, these former students are distributed among a considerable number of departments. Thus, although the McArdle Laboratory is engaged in cancer research, the training program equips the students for research in many fields. Of the postdoctoral fellows who studied with us,

TABLE 2

PRESENT POSITIONS OF FORMER POSTDOCTORAL FELLOWS AT McARDLE MEMORIAL LABORATORY

TEACHING AND RESEARCH		FULL-TIME RESEARCH	
Animal Nutrition	1	Laboratories at medical schools or hospitals	8
Biochemistry	8	University laboratories	4
Biology	2	Special research institutions	9
Exper. Embryology	1	Foreign institutions	6
Oncology	2	Industrial laboratory	1
Pathology	2	Subtotal	28
Pharmacology	3	Other	4
Physiol. Chemistry	4	TOTAL	57
Physiology	1		
Public Health	1		
Subtotal	25		

only two are now engaged in the practice of medicine; the others are employed in various institutes and laboratories doing full-time research. It may be of interest that most of these laboratories are connected with medical schools, hospitals, universities, or the government—in fact, only one person is now working in an industrial laboratory. The main point I wish to make in presenting this information is that a research institute can play a small but significant role in supplying well trained persons to medical schools both for teaching and research.

It is of interest that more than one-third of the postdoctoral fellows who have been in our department have been foreign students, and this proportion has been increasing in recent years. This is owing in part to the greater number of foreign students who wish to obtain training in this country, since we have assumed leadership in various scientific fields. Another factor which has contributed is the greater willingness of departments and institutions in this country to accept foreign students for training, largely because many of the top graduates of our own country obtain permanent positions soon after graduation. As a consequence, the number of American students both at the graduate and postdoctoral level is greatly limited.

The shortage in the field of medical research of highly superior students native to this country is aggravated by the fact that many potential students are attracted to other fields in which they are also needed, such as physics and engineering. In short, the graduate students are now spread very thinly among the universities in this country, so that in some fields the training program is limited by the availability of students rather than of funds.

McArdle illustrates the influx of foreign students who are filling some of the available positions. By far the greater number of foreign students have been postdoctoral fellows—21—as compared with three graduate students who have earned their Ph.D. in our department. Table 3 shows that more than a dozen different countries have been represented by these students.

Our institution has also taken an active part in the medical school's program of acquainting medical stu-

TABLE 3

STUDENTS FROM OTHER COUNTRIES
FORMERLY AT MCARDLE MEMORIAL LABORATORY

Argentina	1
Belgium	1
Brazil	2
Canada	5
England	1
France	1
Germany	4
Greece	1
India	3
Israel	1
Japan	1
Norway	2
Peru	1
TOTAL	24

dents with research. For several years a small number of students have taken advantage of this program by working on some project with a faculty member of our department. The program expanded rapidly 3 years ago, when the Public Health Service made funds available for such training, and it reached its greatest popularity during the past summer when nine medical students were first introduced to research in our department.

In summary, it should be emphasized that the training of students for medical research is one of the prime functions of medical schools. Institutions associated with medical schools and devoted to medical research can play a vital part in the training of such students. Such training should be done only by those actively engaged in research. The results of such a program at one institution are presented; it is of interest that almost all the graduates have continued in research and teaching at outstanding institutions.

No TV for the M.D.

More than 7,000 medical periodicals are published in the world today, of which over a third are American.

Dr. Frank B. Rogers, Director of the National Library of Medicine in Washington, D.C., stated, in a talk on "Books and Medicine" at Yale University recently, that the literature of medicine has been increasing at an explosively accelerating rate.

In 1880, there were 864 medical periodicals being published throughout the world, as against today's 7,000. About 300 new medical periodical titles appear each year.

Despite pessimism on the part of many that bibliographers will not be able to keep up with the output of writings in the field of medicine, Dr. Rogers asserted that the use of machine methods to quicken the processes of medical bibliography holds great promise and investigations are now being pursued along these lines.

The Teaching of Psychiatry to Interns

ROBERT S. DANIELS, M.D.* and E. BRUNO MAGLIOCCO, M.D.†

(University of Cincinnati, Cincinnati, Ohio)

INTERN EDUCATION is a phase of medical training which has not been emphasized.[1,2,6] A review of the literature reveals little information about a teaching methodology which would provide a worth-while and enduring experience. Rather, more emphasis has been put on how to secure interns for service purposes.[4] The problem of obtaining more and better interns is not often approached from the point of view of how a better training program, and thus a more desirable one, could be provided.[2,5,6]

The authors were presented with the opportunity to organize a 1-month psychiatric teaching program in a rotating internship of a University general hospital.[1] These interns had widely divergent interests and needs relative to their own personalities and career plans. For many of them, this would be their last contact with psychiatry in a setting where training possibilities were present. The goal of the authors and their associates was to provide the kind of experience in psychiatric principles and understanding that all physicians need and can use in their every-day practice.

METHODS

Cincinnati General Hospital is an 810-bed approved, rotating internship accepting 52 interns for a 1-year period. Twenty-four (two in each month) spend 1 month on a 60-bed acute psychiatric service which is an integral part of a psychiatric residency training program approved for 3 years.

The therapeutic team consisted of two 3d-year residents (the authors), six 1st-year residents spending 6 months on the service, two interns, graduate and student nurses, psychiatric aids, psychologists, social workers, and an occupational therapist. One of the 3d-year residents (the administrative resident) had the responsibility for the effective functioning of the unit. The other (the teaching resident) was concerned with certain aspects of intern and resident teaching as well as research.

Approximately 25 patients, already on the ward, were assigned to each new intern. The primary responsi-

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[1] This research was based in part on a pilot study done by Robert J. Kalthoff, M.D.

bility for these cases belonged to the 1st-year resident. New admissions, approximately two a day, were assigned in rotation, and the intern performed a mental status and a physical examination on each of these. He was expected to obtain a psychiatric anamnesis on the first patient assigned to him on a given day and was encouraged to do this on all new patients. After consultation with the responsible resident, he frequently took charge of the patient's physical care. Contacts with relatives were required. The routine laboratory tests were carried out by technicians.

The teaching program consisted of at least 19 hours weekly; 6 hours were individual ones with the 3d-year residents (Table 1). Additional sessions include: informal evening teaching; conferences with social service, psychology, and occupational therapy; an inspection of a long-term state psychiatric hospital; and a visit to the Probate Court. Each intern was assigned a new patient to provide him with the opportunity to formulate and carry out a therapeutic plan with the psychiatric team concept in mind. This program was applied to twelve interns during a 6-month period.

On the last day of his service, the intern was asked for a critical evaluation of his experience including the teaching program. At the end of the internship an anonymous questionnaire was sent to each intern. Comments and suggestions about the psychiatric program were sought in order to evaluate it with a different parameter.

TABLE 1

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
8	Daily rounds	Daily rounds	Daily rounds	Daily rounds	Daily rounds	Daily rounds
9						
10				Clinical director's rounds	Therapeutic planning and ward management conference	
11	*Application of dynamic theory*	Case presentation		*Application of dynamic theory*		
12						
1		*Individual case supervision*	*Instruction in interviewing technique*	*Additional individual sessions*	*Walking ward rounds*	
2						
3						
4						

*Individual sessions are italicized.

Description and Function of the Teaching Program

The intern may approach the service with enthusiasm or reluctance. He may have selected a rotation because he wanted psychiatry, or he may have resigned himself to it in order to secure a rotation including other desired services. The initial contact with the interns was made 1 week prior to their arrival with a request to arrange their own on-call schedule.

Introductory session.—The first interpersonal contact revealed the level of the intern's anxiety. The common uneasiness in approaching a new experience was recognized. A positive relationship was established by giving instructions in new specific techniques such as the mental status examination and the use of staractic drugs and security measures. The intern's previous psychiatric background, as well as his future interest and plans, were explored in order to appraise his individual needs. Inquiry was made as to what he wanted from this psychiatric experience. The service responsibilities were explained with emphasis on the intern being an important part of the therapeutic team. The possible fulfillment of his needs was indicated by a review of the teaching program.

The sequence presented was planned so that the intern might overcome some of his initial fear prior to telling about himself and his interests. The atmosphere was one of giving and established the pattern for the coming training program.

Individual Sessions

1. *Application of dynamic theory.*—The administrative resident spent 2 hours a week in a survey of personality development and structure with emphasis on anxiety and the mechanisms of defense. Current case material repeatedly was introduced to illustrate the practical aspects of the theoretic structure. These sessions almost always developed into a group give-and-take with the intern frequently introducing material from his own experience and/or his own dynamics. For example, while considering the oedipal phase of development and infantile sexuality, a male intern began to discuss his difficulty with women patients. Later, he was able to relate his anxiety to his own impending marriage. In another instance, while reviewing the development and expression of hostile feelings, a male intern began to discuss his own interpersonal problems in dealing with elderly male patients. Later in the month he talked privately about his anger to his controlling, domineering father. In both interns, the conscious awareness that they were displacing to patients affects relevant only to key people in their personal life enabled them better to care for a particular group of patients.

2. *Walking ward rounds* were conducted an hour each week by the teaching resident. The plan was to see four to five patients in brief interviews. The teaching resident selected pertinent case material, but often the intern requested that a particular problem case be seen for diagnostic clarification. This session enabled the intern to make a quick appraisal of a variety of patients by the early recognition of mental status phenomena and specific symptomatology. Nosology was emphasized. The interest in single dynamic patterns was so great that it often limited the number of patients seen. The problem confronting the instructor was one of complete exploration of a dynamic pattern versus the possibility of observing a variety of symptomatic pat-

terns in different patients. The interns thought, in retrospect, that this sort of teaching was beneficial.

3. *Instruction in interviewing techniques.*—Interviewing techniques were reviewed in a weekly 1½-hour session with the teaching resident. The interviews were limited to 20 minutes. This is the average duration of an office visit in the general practice of medicine. To reduce the anxiety, the teaching resident conducted his interview first, with the two interns as observers. Later, each of the interns interviewed a different patient in a similar setting. The aim of the interviews was not to secure diagnostic information but rather to understand the dynamics of the interchange between patient and physician. The detailed 1-hour review offered an excellent opportunity to discuss different interviewing techniques and to explore the concepts of transference and countertransference, demonstrating the universality of these phenomena in all doctor-patient relationships. This introduction provided the basis for a more intensive examination of interviewing techniques with tape-recorded material. Tape recording provoked anxiety within the intern. To reduce this anxiety, these records were reviewed in an informal evening session near the end of the intern's service.

One male intern utilized authoritarian and domineering interviewing methods which interfered with his ability to establish a meaningful interpersonal relationship. This became apparent in his first supervised interview. When a tentative clarification was made, he denied its significance and excused himself on the basis of the limited time available. Later, when the intern was confronted with his technique while listening to his own tape recorded interview, he readily admitted its use and expressed the anxiety he felt on interviewing. Still later, a useful modification was observed.

4. *Individual case supervision.*—In his first week on the service, each intern was assigned a patient for whom short-term goal limited therapy was indicated. The future needs and interests of the particular intern were considered. As the intern had complete responsibility, the teaching resident provided a weekly 1½-hour supervision session. Initially, attempts were made at clinical, dynamic, and genetic diagnosis. A therapeutic plan was devised as to the type of therapy, the length and frequency of interviews, the focus of therapeutic effort, the use of organic or drug therapies, and predictions about potential problems.

It was always possible to suggest areas of further investigation to bring the intern into direct contact with other members of the therapeutic team. The social worker provided an individual session at which the environmental factors contributing to the patient's illness were discussed. Emphasis was placed on the role that social work might play in any type of medical practice. Case workers contributed further understanding by contact with relatives and frequently participated in post-hospital planning. The psychologist performed a battery of projective and intelligence tests which offered an opportunity to understand his techniques and to check the provisional dynamic formulation and the proposed therapeutic potential. The occupational therapist planned a productive therapy experience for the patient, and, in doing so, outlined his function on the psychiatric team.

In the weekly supervision the de-

tailed material in its manifest and latent content was considered. Therapy was limited to relationship, support, and suppression. This was another session in which discussions of transference and countertransference material could be meaningful. It was a gratifying experience for many of the interns to accomplish their limited goals and to discharge their patients. This undercut the concept that all psychiatric treatment needs to be a lengthy endeavor. For the intern who was unable to discharge his patient, feelings of separation and phantasied failure were worked through. The resolution of these important dynamic problems provided a valuable learning experience for the interns.

A woman intern, whose career plan was to be a surgeon, was assigned a depressed patient in whom a cervical malignancy was suspected. The patient initially refused a pelvic examination and denied to the male resident and the intern any symptoms in that area. After the intern established a relationship, the patient revealed that she had had vaginal bleeding and was frightened by the phantasy of cancer and death. With continuing support by the intern the patient accepted a pelvic examination and a cervical biopsy. Furthermore, when told that surgery was indicated, the patient discussed its implications and her fears of a total hysterectomy. At this time her depression was fading, and she accepted transfer to the surgical service asking that the intern might continue as one of her doctors. The relationship was maintained before and after surgery. At the time of discharge there was no evidence of depressive symptomatology.

5. *Teaching by first-year residents.*—The free time of the resident was limited, but those interested in teaching found time to do so. This was another informal but potentially valuable source of instruction occurring in connection with specific patients and on an individual basis. Often the intern and resident accompanied one another to solve ward problems and to see patients in the admitting room. The comments of the interns were unanimously in favor of more teaching contacts with the 1st-year resident.

Group Sessions

6. *Daily rounds.*—These were daily hour-long meetings at which the entire team met. They discussed and interviewed new admissions and considered the status of old patients, therapeutic plans, ward problems, and psychology and social service referrals. Although the primary function was the promotion of an integrated team effort, there were many learning opportunities for the intern. Each morning he presented a new admission. The differential diagnosis and therapeutic plans were discussed. Furthermore, these meetings offered opportunities to observe the interviewing techniques of others and to understand the day-to-day functioning of social service, psychology, and occupational therapy. They expanded his available techniques for recognizing and dealing with psychiatric emergencies and other problems. The intern tended to remain on the periphery of the group unless efforts were made by the authors to include him. He then became a valuable contributing member.

7. *Clinical director's rounds.*—The clinical director met with three of the 1st-year residents and the interns once a week for 1 hour. They discussed two to three patients with the focus on differential diagnosis, the use of organic therapies, and management problems. The practical ap-

proach to single clinical problems which could be briefly discussed and solved met a need within the interns, as evidenced by their favorable comments about this session.

8. *Case presentation.*—A rotating staff psychiatrist conducted a weekly 1½-hour group meeting. A resident presented one case to elucidate genetics, dynamics, and clinical diagnosis. No efforts were made to aim the teaching specifically at the intern's level. For the first 2 or 3 months they profited. As the teaching became more advanced, the new interns felt this session was beyond their level of understanding.

9. *Therapeutic planning and ward management conference.*—This 2-hour weekly conference, oriented about group techniques and understandings, was led by the same visiting staff psychiatrist. The continuity provided enabled the group to become more direct in their expression of feelings and to consider increasingly complex psychodynamic constellations. The intern's response shifted from a favorable one in the early months to the later feeling that this was "over their heads." This discrepancy is explained by the ongoing nature of the team's interaction and development.

10. *State hospital visit.*—Each month the superintendent of a large state mental hospital met the interns for a 2-hour orientation session aimed at elucidating the problems and community functions of state hospitals. The interns were shown the physical facilities, and an effort was made to describe the positive and negative aspects of such institutions. The interest and enthusiasm of the superintendent made this session worth while. The interns were unanimously favorable in their response to this meeting.

11. *Probate Court visit.*—The interns spent one morning a month observing the functioning of the Probate Court. Emphasis was on an increasing awareness of the implications of the commitment procedure and its effects on the patient and his family. These sessions were supervised by an experienced and sensitive Clerk of the Probate Court, and were regarded with favor by the interns.

Discussion

The internship was created for furthering the theoretic knowledge and practical experience that the student acquires in medical school. Since this is an experience shared by almost all physicians, it is startling to discover a lack of interest in the literature. This deficiency may be related to the concept that interns exist primarily to provide service. The internship must be an important and different extension of the learning process.

The teaching of most internships has been incorporated into the residency training program. This may be a suitable approach for a straight internship, since the development of the intern and resident occurs in a parallel fashion. In a rotating internship, however, the frequent changes in service limit the effectiveness of this methodology. The solution to the dilemma can only be through a methodology involving special teaching at the intern level.

The program reported provided at least 8 hours of individual teaching each week, as well as 11 hours of group teaching. Early in the period of observation, both individual and group sessions were felt to be productive. Later, when the needs of the resident group had changed because of their maturation process, the group meetings diminished in

their value for the interns. Only the daily rounds and the clinical director's rounds continued to be of the same effectiveness. The practical approach to clinical problems in which the intern was sharing was emphasized in both of these. The other group sessions were concerned with theoretic considerations which were of little practical value.

A further confirmation of the worthwhile nature of the individual session was obtained when the interns unanimously commented favorably on these. They retrospectively thought that the instruction in interviewing technique, with special mention of the usefulness of tape recording, and the individual case supervision were the most valuable parts of their psychiatric experience.

The authors found the teaching of the interns to be a gratifying experience. Although we only began to see the results of our efforts when the intern transferred to another service, our satisfaction came from the knowledge that we had provided an important influence in their development and from their recognition that this had been a worthwhile experience.

Intern teaching is stimulating to the beginner in academic pursuits, since it offers the possibility for a valuable teaching experience in a group that is eager to learn. It is imperative to have someone who is both interested and has available time to organize a continuing program. The repeated necessity to cover the same material may become monotonous. Therefore, the authors suggest a yearly change in the instructors dealing with individual sessions.

This methodology has suggested several areas of future research. The inclusion of further clinical material, outpatients, who most closely simulate those seen in private practice, would provide a better experience. More integration of teaching between departments would also be productive. The structure of most hospitals offering a rotating internship makes these modifications difficult without some major revisions in their programs.

Summary

1. Methodology for intern teaching has been described.

2. A teaching program for the psychiatric portion of a rotating internship is detailed.

3. Its results are applicable to all services.

4. Teaching aimed jointly at interns and residents is of limited effectiveness.

5. Specific teaching for interns is essential.

6 Suggestions for further areas of investigation are made.

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Medical Education Forum

Editorials

But Where Is Medicine?

For some undisclosed *reason*, the medical sciences seem to have been left behind in the mad rush for outer space.

In recent months the dramatic advances in rocketry, culminating in several launchings into outer space, have had an equally dramatic effect on public attitudes toward education and research. Suddenly, the scientist-educator who was considered an "odd ball" has become a person of some respect and even distinction. Science and education have emerged as the saviours of democracy. Throughout the country, lay groups are examining educational and scientific programs to determine what can be done to improve the educational process and to expand research. Whereas, Sunday afternoons and evenings were once spent in pleasant televised visits to Angkor Wat, New Delhi or the villa of an artist, now the screens are occupied by panels of distinguished educators and scientists expressing their deep concern at the U. S. lag in their fields. A commission of distinguished scientists has been designated to counsel with the President's Special Advisor on Science.

Yet, it seems that in all of these gatherings there is a singular lack of representation from the biological and medical sciences. No one would deny that many of the most significant scientific advances in the last quarter century have come from the biological and medical sciences; nor that the future accomplishments in outer space—and inner space—will depend upon a greater understanding of the problems of the biological life of man and their relationship to the external environment.

Perhaps medical scientists and medical educators have been too remote from other scientific areas although the direction of biological and medical research is constantly toward a greater affinity with physics and chemistry. Perhaps biology and medicine are not considered to be sufficiently scientific to justify their inclusion in higher counsels. However, biology and medicine were dramatically represented in Sputnik II.

Let us hope that these early gatherings of scientific minds without medical representation do not represent the true attitude towards the importance of medicine. Biology and medicine are integral factors in the current concern for science and mankind. A more adequate representation in the examining groups is urgently needed. *J. Z. B.*

Excerpts

*Changes in Medical Education in France**

Under the chairmanship of Professor Robert Debré, the Inter-Ministerial Commission, appointed to study problems of medical education in hospital systems and health and social programs began its work in October, 1956. In July, 1957, it submitted to the Ministers concerned a preliminary bill, the main features of which are given below.

The main purpose of this law is to bring about a closer cooperation in all spheres of medical activity between the medical faculties and the hospitals of university towns in which future doctors acquire most of their medical education and in which medical research is carried on.

Principal Changes Proposed

1. *Changes in the appointment of hospital doctors and in the organization of medical studies.*—Under the proposed law, hospital administrations would retain their autonomy, but hospital and university titles would be placed on the same level. The competitive examination for nonresident medical students *(concours d'externat)* would be integrated with the medical studies. From the 3d year onwards, all students would serve as hospital assistants *(externes)* and would live entirely at the hospital. The examination for resident student *(internat)* would still be given locally by the hospital, but the resident students *(internes)* could be appointed as moniteurs (assistant instructors) by the Ministry of National Education. University hospital doctors would be selected on the basis of a national competitive examination held for resident students and would at the same time be appointed lecturers by the Minister of National Education.

2. *Introduction of full-time employment.*—University hospital doctors would not be allowed to hold a private practitioner's license. They could, however, be called into consultation by a private practitioner and would also be allotted 5 per cent of the hospital beds for their own personal patients. An intermediate body of doctors between the hospital doctors and the private practitioners would be set up, however, to preserve the essential link between hospital and urban medicine. In addition, provision would be made, among the specialists' examinations held for certificates awarded after the Doctorate, for an examination in social medicine.

3. *Medical research.*—Medical students from the beginning of their 4th year, and resident students in hospitals, would be allowed to take courses in research. Research workers will have the same titles and salaries as those specializing in clinical medicine, as set out in Table 1.

The various instruments to put the law into effect have already been prepared. They include modifications in the P.C.B. certificate (physics, chemistry, and biology) providing for the participation of professors of

* From a brochure "Education in France," issued in January, 1958, by the Cultural Services of the French Embassy.

the Medical Faculties, and changes in the program of studies to the effect that the 1st year will be reserved for the study of basic subjects.

Objections

Hospital staffs have offered some objections to the proposals. They have pointed to the danger of the spread of officialism in the medical profession. They have also urged that a solid clinical grounding should be given to students during the 2d year. Students have mainly commented on the anomaly of retaining the competitive examination for the *internat* in its present form, while altering the *externat*.

The organization of the academic staff of medical faculties in France is indicated in Table I.

TABLE I

Minister of Health		Minister of National Education
	CLINICIANS	
Externes	Appointed according to results of Faculty examinations including an examination in normal and pathological semeiology	
Internes	many of whom are also	Clinical assistants (moniteurs de clinique)
Assistants	all of whom are also	Chefs de clinique (heads of clinic)
Heads of service (physicians, surgeons, hospital specialists)	all of whom are either	Maitres de conferences (lecturers)
	no change for	Professors
	BIOLOGISTS	
Some students, both "internes" and "externes"	Postgraduate students as	Moniteurs de biologie (assistants in biology)
Instructors in biology	all of whom are also	Chefs de travaux
Heads of service	all of whom are also	Maitres de conferences (lecturers)
	no change for	Professors
	RESEARCH WORKERS	
No changes proposed, the order remaining as follows: stagiaire, attache, charge de recherches, maitre and Directeur de recherches (of the Institut National d'Hygiene or the Centre National de la Recherche Scientifique); however, the number of posts would be increased as a result of the development of research units in hospitals of university towns and transfers to the teaching staff would be possible as from the title of master of research.		

Chauncey D. Leake, M.D.
The Ohio State University
Columbus, Ohio

Minutes of Special Meeting

Association of American Medical Colleges

8:00 p.m., February 8, 1958
Palmer House, Chicago, Ill.

Dr. Lowell T. Coggeshall, President of the Association, presiding.

I. Dr. Coggeshall read the call for this special meeting as it has been published in Memorandum #8 of December 27, 1957.

II. Roll call revealed the following schools were represented:

Medical College of Alabama
Baylor University
Bowman-Gray
Chicago Medical School
Creighton School of Medicine
University of Chicago
University of Cincinnati
University of Colorado
Columbia University
Cornell University
Dartmouth Medical School
Duke University
Emory University
Medical College of Georgia
Hahnemann Medical School
Harvard Medical School
University of Illinois
Indiana University
State University of Iowa
Jefferson Medical College
University of Kansas
State University of N. Y.
Louisiana State University
University of Louisville
Stritch School of Medicine
University of Miami
Marquette University
University of Maryland
College of Med. Evangelists
University of Michigan
University of Minnesota
University of Mississippi
New York Medical College
New York University
University of North Carolina
University of North Dakota
Northwestern University
Ohio State University
University of Oklahoma
University of Pennsylvania
University of Pittsburgh
University of Puerto Rico
University of Rochester
Saint Louis University
Medical College of South Carolina
University of Southern California
University of Texas—
Southwestern Medical School
Stanford University
University of Texas
Tufts University
Tulane University
University of Utah
Vanderbilt University
University of Vermont
Medical College of Virginia
University of Virginia
Washington University—St. Louis
Western Reserve University
West Virginia University
University of Wisconsin
Yale University
Mayo Foundation
New York University Post Graduate School
University of Pennsylvania Graduate School
Dalhousie University
University of Saskatchewan
University of British Columbia

III. Dr. Coggeshall explained the purpose of the meeting as the first annual winter get together to discuss business affairs and other items of interest in an effort to provide better communication between the representatives of the schools and the officers and staff of the Association. By unanimous voice vote this annual winter meeting was authorized.

IV. The following resolution was unanimously approved by a rising vote and a period of silence:

"The Association of American Medical Colleges wishes to express

the deep regret of its membership on learning of the death of Dr. Stockton Kimball, Dean of the University of Buffalo School of Medicine and Treasurer of the Association.

"As an educator, Dr. Kimball made significant contributions to the entire field of medical education and practice. Under his leadership as Dean, the University of Buffalo School of Medicine rapidly developed its education and research activities and participated actively in experiments of national significance in medical education.

"While Chairman of the Joint Committee on Medical Education for National Emergency, he was responsible for expressing to the Government and other agencies the importance of medical education to national defense.

"In his role as Treasurer, and as a member of the Executive Council, he made valuable contributions to the programs of this Association.

"Be it Resolved that the Association of American Medical Colleges extend to the family of Dr. Kimball, as well as to the faculty of the University of Buffalo School of Medicine, our feeling of loss and deep sympathy."

V. Dr. Coggeshall summarized the following actions and considerations of the Executive Council meeting just concluded:

(a) A decision to join with the National Commission on Accrediting in seeking support for a national study of accreditation.

(b) A review of the importance of the MEND program as it presently exists and the possibility of using this as the framework for further planning for the part which the medical schools might play in meeting a national emergency.

(c) The authorization of the staff of the AAMC to work with the staff of the AMA Council on Medical Education and Hospitals in the preparation of a statement indicating the criteria that should pertain if an institution or community is to qualify for development of a new school of medicine and also the data which should accompany an application for such consideration. This statement is to be presented later for the official consideration of the two Councils.

(d) The decision that at the next Annual Meeting of the Association it would be proposed that no new medical school should be established unless it was affiliated with a university or college.

(e) The decision to join with the AMA Council on Medical Education and Hospitals in one annual questionnaire, the idea being to cut down upon the number of questionnaires reaching the deans in any one year.

(f) The appointment of Dr. Richard Young of Northwestern as Acting Treasurer until a new Treasurer can be elected at the fall business meeting.

VI. Dr. Coggeshall summarized the present situation regarding Congres-

sional consideration of matching funds for construction and the payment of the full costs of research.

There seems to be an excellent chance that the construction bill may pass. A House hearing upon this question will probably come some time in March. About 30 deans have responded to the request for statements indicating their stake in this bill. Work has begun upon the preparation of testimony for both the House and Senate hearings.

Dr. Coggeshall advised that the Administration is asking for full payment of indirect research costs. This will mean support in the budget hearings from all government witnesses. Many witnesses representing the voluntary health agencies will also testify favorably. Dr. Coggeshall will testify before the House Committee within the next two weeks. The Committee appointed by the American Council on Education (formerly Dr. James Killian, now Dr. Lee DuBridge, Chairman) to work with the Bureau of the Budget upon this matter, has come to a satisfactory agreement. This should be of help.

Dr. William Willard of the University of Kentucky brought up the need for Federal funds for teaching beds and suggested that the Association work for this by urging its provision in the Hill-Burton bill, the extension of which is currently under consideration. After discussion, centering around the possibility that such a move might endanger favorable consideration of the construction bill, a motion to try for an amendment to the Hill-Burton bill was defeated by a vote of 32 to 29.

VII. Dr. Coggeshall then reminded the Association of the resolution submitted at the last Annual Meeting by the Committee on Medical Care Plans regarding "Institutional Group Practice by Clinical Faculties of Medical Schools. A Statement of Principles". The Council is referring this resolution, with very slight modification, to the deans with the hope that they will review it with their faculties. Dr. Coggeshall also expressed the hope that the deans, in turn, would submit any faculty reaction, including suggestions for modification or change, to the central office, so that a final proposal might be prepared for the consideration of the Association at its fall business meeting.

VIII. The Executive Director was then asked to discuss his hope for an increase in the number of individual memberships. The ideas pertinent to this matter, as outlined in the "First Report of the Executive Director" (Journal of Medical Education, January 1958, page 72) were emphasized. The association was then asked to approve the following proposal:

(a) The central office write each dean asking for the number of full time and part time and volunteer faculty.

(b) Each dean then to be sent the appropriate number of envelopes so that two complete sets can be processed with names and addresses and returned to the central office.

(c) This will provide addressed envelopes for two direct contacts

with faculty, so that the purposes and program of the Association can be explained and individual memberships invited.

After considerable discussion a motion to this effect was made and passed by a majority voice vote.

Adjournment

Book Reviews

K. E. Penrod
Book Review Editor

Adventures in Medical Education

G. Canby Robinson. Published for the Commonwealth Fund by Harvard University Press, Cambridge, Mass. 1957. XII + 233 pp. $5.

Except for texts and significant monographs, relatively few books can be tagged "a must" in the professional reading of a medical educator. Doctor Robinson's autobiography—*Adventures in Medical Education*—is such a volume. Older medical educators will read this personal account with pleasurable nostalgia. Fledglings will discover in it much of what makes the current scene historically meaningful.

The memoirs of elder statesmen too often expose the authors' lapses into egocentric reminiscing. Because Robinson has consistently avoided this snare his story assumes a certain quality of timelessness characteristic of a genuine historical study. His text is not adorned with aphorism or cliche; it reflects the author's personal grace, candor, and humility. Here is a man in his sunset years, who (if his book is any testimony) because of a life of industry, self discipline, and dedication, is able in his eighth decade to write both objectively and with significant interpretation.

Few medical educators need to be reminded that Dr. Robinson was a person of wide influence in medical education and administration for thirty years prior to World War II, that he directed the Blood Donor Service of the American Red Cross throughout the emergency, and that thereafter he was director of the Maryland Tuberculosis Association until he retired to village life in April 1955. He spread the Johns Hopkins tradition of laboratory research and full-time professorships in clinical departments at Washington University School of Medicine, Vanderbilt University School of Medicine, and New York Hospital-Cornell Medical College Association (Center), in which institutions he had major administrative responsibility. He retired as director of the latter in 1934 when circumstances conspired to splint his best efforts. It is this reviewer's opinion that the unfortunate episode enhanced the stature of Dr. Robinson and demonstrated the capacity of a Quaker gentleman to meet reverses with becoming tranquility. Time has justified the wisdom of his ideals and objectives at Cornell.

Medical school deans, among whom there is a rapid turnover, will find com-

fort in this authentic saga laid in the transitional decades of American medical education. Likewise, teachers from instructor to professor will gather wisdom and inspiration from these memoirs of a too-little heralded educator in the "heroic age" of American medicine.

W. F. Norwood, Ph.D.,
College of Medical Evangelists

Atlas of Commoner Skin Diseases

Semon and Wilson. 5th Edition. Pp. 371 with illus. $30.00. Williams and Wilkins Co., 1957.

This fifth edition of the "Atlas of the Commoner Skin Diseases" marks the 22nd year of its existence. This fact alone is a testimonial to its usefulness. The illustrations are excellent, as a rule, and the text is very adequate for a book of this scope.

Its usefulness, particularly for American students, is limited for several reasons: namely, (a) Some of the conditions considered as common in the book are rare in the United States; e. g., chilblains, erysipeloid, Favus and tuberculosis of the skin. (b) There are no illustrations of skin diseases in negroes, which would be very important to the groups for whom the book is intended; i. e., students and practitioners untrained in dermatology. There are some omissions of common conditions seen in the United States; e. g., herpes simplex, dermatophytid and plant dermatitis ("poison ivy"). The section on syphilis is weak, since there are no illustrations of congenital syphilis or of condylomata of the genital region or of annular lesions of the face. The latter are among the lesions most commonly seen in early syphilis. In this section too, illustrations of negro patients would have been helpful. In spite of the above criticism, the book will prove useful to those who have need for a simple atlas.—Sidney Olansky, M.D., *Duke Univ.*

ABSTRACTS

The Chemical Dynamics of Bone Mineral

William F. Neuman and Margaret W. Neuman. The University of Chicago Press, Chicago. 1st Edition, 1958. Pp. 203.

The physiology of bone is broad and complex. The disciplines that contribute to our growing knowledge of bone are diverse and no one can presume to be an expert in all of them. The unifying concepts in this book have been sought at the molecular level and these, as building materials, have been assembled by physical, chemical and biochemical rules and views. In some cases the building materials were not of the first order. This is a result of inadequate knowledge in some phases. The authors feel strongly, however, that this structure, or general synthesis, is very much needed as a place where the various disciplines can meet, interact and get together. They further believe that the keystone and the foundation on which this book was built are fundamentally sound. The foundation is the surface chemistry of the mineral substance of bone. The keystone is the recognition of the peculiar solubility properties of this mineral substance. Bone mineral can and does exhibit wide and varying solubilities. For this reason, a given concentration product or activity product calcium times phosphorus in certain histologic areas, can be considered undersaturated, in others just saturated, while in other areas, serum in particular, the same product represents a highly supersaturated condition. How this paradox comes about and its importance in the calcification process and homeostasis are explained in this book. The purpose of this monograph is to stimulate interest in research. It is aimed at the inherently curious; the clinician wonders why, the anatomist wonders where, the chemist wonders how, and just any investigator wonders whether.

The Principles of Exercise Therapy

M. Dena Gardiner. G. Bell and Sons, Ltd., London. Distributed by MacMillan Co., New York. 2nd Edition, 1957. Pp. 287.

This book has been written for all those who are interested in the use of exercise to promote physical rehabilitation. It is, however, primarily designed to provide students training in physiotherapy with a simple theoretical background for the practical instruction they receive in the performance and use of movement and exercises for therapeutic purposes. An effort has been made to collect and integrate the various techniques now in common use and to arrange them according to the purpose for which they were designed. A sound

knowledge of basic principles, an open mind and a spirit of inquiry are essential to progress and the discovery of the methods most suitable to achieve results. In the second edition of this book, a new chapter has been added on proprioceptive facilitation written by Miss Monaco Martin Jones as an introduction to the method of neuromuscular re-education. This chapter, in common with the rest of the book, is intended to stimulate interest and to provide a simple theoretical background as an adjunct to practical instruction whenever and wherever this is available.

The Annual Survey of Psychoanalysis

A comprehensive survey of current psychoanalytic theory and practice. Edited by John Frosch and Nathaniel Ross, with 28 contributing editors. Volume 4, 1958. International Universities Press, Inc., New York. Pp. 793.

This volume of the Survey continues to follow a flexible policy, adapting itself to the current literature rather than forcing it into a rigid frame of reference. This approach results in the addition or deletion of various chapters from year to year. Papers published in 1953 necessitate the reappearance of two chapters in this Survey, one on History and the other Training. A serious attempt has been made in this edition to cover completely the literature on psychoanalysis through the date of publication.

Preventive Medicine for the Doctor in His Community

An Epidemiologic Approach. Hugh Rodman Leavell and E. Gurney Clark plus nineteen contributors. McGraw-Hill Book Company, Inc. 2nd Edition, 1958. Pp. 664.

This book is directed primarily to the development of a point of view, a philosophy, and a method of approach to health promotion and disease prevention. The authors have sought to present a way of looking at health and disease which they believe is essential to the conscientious practitioner who wants to give his patients the kind of doctoral care they are fast learning to expect. The book is designed primarily for those expecting to enter private practice and has as its objectives: (1) to expand the concept of preventive medicine for wider application, (2) to give an understanding of the essentials involved in promoting health and preventing disease, (3) to point out the value of practicing medicine from the preventive point of view and to motivate practitioners to incorporate this concept in their practice, and (4) to develop this philosophy and point of view so as to enable the practitioner to see and appreciate the whole picture of community health activity, realize that the role of the private practitioner in health matters, while essential, is only one of many, and find pleasure in relating his work to the total health job. This second edition has been expanded, brought up to date, and rearranged in accord with suggestions from reviewers and teachers of preventive medicine. A new chapter on the natural history and prevention of oral disease has been added, and a chapter on multiple screening in the previous edition has been combined with the one on long term illness.

Aids to Obstetrics

Leslie Williams. Bailliere, Tindall and Cox, London. 18th Edition, 1956. Pp. 257.

This little book is not meant to serve as a textbook but as a small manual which will recall knowledge acquired in the Obstetrics Department and bring back to mind instruction received in lectures, ward rounds, etc. On the occasion of this new edition many chapters have been altered considerably. But the possible overdogmatic style of instruction has been retained. No apology is offered since this style probably simplifies matters for students, who may also find help in the new appendix that has been included giving a list of some of the drugs used in obstetrics.

Textbook of Virology

For Students and Practitioners of Medicine. A. J. Rhodes and C. E. Van Rooyen. Williams and Wilkins Company, Baltimore. 3rd Edition, 1958. Pp. 607.

The rapid advances that have occurred in virology in the last three years have necessitated substantial revision of this book, for much additional information has become available about those virus infections mentioned in the earlier editions; and furthermore, many new virus diseases have been recognized. The objective in writing this book remains unchanged, and that is to present an account of the essential features of the virus and rickettsial diseases of man in a form suitable for undergrad-

uate and postgraduate students of medicine, bacteriology, virology, and public health. Much emphasis is placed on laboratory diagnosis in this text. This book should prove of particular interest to general medical practitioners and to specialists in dermatology, infectious diseases, internal medicine, ophthalmology, pathology, neurology, pediatrics, public health, preventive medicine, industrial and occupational medicine and tropical medicine.

The Early Diagnosis of the Acute Abdomen

Sir Zachary Cope. Oxford University Press, New York. 11th Edition, 1957. Pp. 184.

In this, the 11th edition, the whole book has been revised to make several important additions. During the last few years, vascular surgery and the operative treatment of intestinal obstruction in the newborn have made great strides forward, so that conditions that were not so long ago regarded as almost hopeless can now, in a reasonable proportion of cases, be alleviated or remedied. The author has therefore added sections dealing with the diagnosis of these serious conditions. He has added a chapter designed to help the practitioner to come to a diagnosis in any particular case which may come under his observation. Paragraphs have also been included dealing with general conditions which have recently become better understood and more definitely diagnosed, e.g. jejunal diverticulitis and volvulus of the stomach. A number of new illustrations have been inserted. This book, in its revised form, should continue to be of help to students, house officers, and particularly those in general practice.

Pharmacology and Therapeutics

A textbook for students and practitioners of medicine and its allied professions. Arthur Grollman. Lea and Febiger, Philadelphia. 3rd Edition, 1958. Pp. 968, 192 illustrations.

In the first edition of the present book, an attempt was made to continue the "severely critical and rigorously scientific" approach to the subject which characterized the original text of Cushny, which it replaced. This has continued to be the goal, although little remains of the substance of Cushny's original text. In the present edition, the general plan of the earlier editions has not been altered. However, each page has received critical scrutiny and many parts of the book have been entirely rewritten. Parts of the book have been rearranged and the original 33 chapters have been expanded to 44 for greater clarity of presentation. Despite the addition of much new material and the consideration of all the official and important drugs, the book has been maintained at a size suitable for use by the student and the practitioner. This has been made possible by the inclusion only of such chemical, physiological, biochemical and clinical details which are germain to the subject and excluding such aspects of these subjects which are of primary interest to the professional pharmacologist only. The growth of pharmacology and therapeutics has made it a formidable task to satisfy the experimental pharmacologist whose interest lies in the broad theory of pharmaco-dynamics, the student who requires a basic course which will permit him to use drugs rationally and effectively, and the empirical practitioner who wishes to keep abreast of the developments in therapeutics. An attempt has been made by the author to satisfy all of these requirements of a basic text. Much has been learned during recent years regarding the mechanism of action of many drugs. Since such knowledge is of basic importance, special attention has been devoted to this aspect of the subject.

The Respiratory Muscles and the Mechanics of Breathing

E. J. Moran Campbell. The Year Book Publishers, Inc., Chicago. 1st Edition, 1958. Pp. 161.

In recent years, anatomists have demanded a better understanding of the dynamics of muscle action that is supplied by the classical methods. Physiologists have devoted much attention to the mechanics of breathing and a better knowledge of the respiratory muscles is becoming increasingly desirable in this field. Little attention has been paid these muscles, lying as they do in a no-mans land between anatomy and physiology. At least part of the reason for this neglect has been the lack of clinical problems requiring accurate knowledge of the physiology of

the respiratory muscles. The improved management of respiratory paralysis, the use of relaxants in anesthesia, the practice of physiotherapy in chest disease and similar developments have changed the situation. The author had three main aims in preparing this book: (1) to gather together the scattered literature on this subject; (2) to form a critical appraisal of previous work; and (3) to present an account which will be intelligible to non-specialist readers as well as to respiratory physiologists. It is hoped that it also will be of interest to anatomists, and to those physicians and surgeons who are concerned with disorders of the lungs, heart and nervous system. Much of it may also interest anesthesiologists, radiologists and physiotherapists. The use of the respiratory muscles in speech and singing has not been dealt with for the reason that much better knowledge of the basic respiratory function of the muscles than presently exists is necessary for such a treatment. Illustrations and detailed description of structural anatomy are not included as they are generally adequate in standard textbooks of anatomy. A full bibliography has been included.

BOOKS RECEIVED

Biochemical Investigations in Diagnosis and Treatment: John D. N. Nabarro, M.D., F.R.C.P. Published by Little, Brown and Company. Pp. 280 with index.

Chemistry and Biology of Mucopoly Saccharides: Ciba Foundation Symposium. G. E. W. Wolstenholme and Maeve O'Connor. Published by Little, Brown and Company. Price $4.50, pp. 323 with index.

Erythroblastosis Fetalis Including Exchange Transfusion Technic: Fred M. Allen, Jr., M.D. and Louis K. Diamond, M.D. Published by Little, Brown and Company. Price $4.00, pp. 143 with index.

The Essence of Surgery: C. Stuart Welch, M.D. and Samuel R. Powers, Jr., M.D. Published by W. B. Saunders Co. Pp. 280 with index.

General Pathology: Sir Howard Florey, Prof. of Pathology, University of Oxford, England. Published by W. B. Saunders Co. Price $16.00, pp. 982 with index.

Group Processes: Transactions of the Third Conference, (October 7, 8, 9, and 10, 1956)—Bertram Schaffner, M.D. Published by the Josiah Macy, Jr., Fdn. Price $4.00, pp. 218 with index.

Heart Disease and Pregnancy: C. Sidney Burwell, M.D. and James Metcalfe, M.D. Published by Little, Brown and Company. Price $10.00, pp. 328 with index.

Heart Disease in Infancy and Childhood: John D. Keith, M.D., Richard D. Rowe, M.D. and Peter Vlad, M.D. Published by The Macmillan Company. Price $22.50, pp. 817 with index.

Hypnosis in Health and Sickness. Gordon Ambrose and George Newbold. Published by Staples Press Ltd., London. Pp. 196 with index.

Ideals in Medicine: Vincent Edmunds and C. Gordon Scorer. Published by The Tyndale Press, London, England. Pp. 192 with index.

Microdiffusion Analysis and Volumetric Error: Edward J. Conway, M.D. Published by The Macmillan Company. Price $2.50, pp. 466 with index.

Pharmacology in Medicine: Victor A. Drill, M.D. Published by the McGraw-Hill Book Co., Inc. Price $12.50, pp. 1271 with index.

Polysaccharides in Biology: Transactions of the Second Conference, April 25, 26, and 27, 1956. Georg F. Springer, M.D. Published by the Josiah Macy, Jr. Fdn. Price $5.00, pp. 345 with index.

Editor's Note: We regret errors which appeared in the review of "The Student Physician" in the March, 1958 number of this journal. The authors of this book are Robert K. Merton, George G. Reader, M.D. and Patricia L. Kendall. The reviewer was George Harrell. Dean of the University of Florida School of Medicine.

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Items of Current Interest

American Heart Association

Dr. George E. Wakerlin has been appointed Medical Director of the American Heart Association, it was announced by Dr. Robert W. Wilkins, Association President. Dr. Wakerlin assumed his duties on April 1. He was formerly with the University of Illinois College of Medicine in Chicago, where he served as professor and head of the department of physiology since 1937.

Medical Audio-Visual News

A new service has been developed for medical education which is described by leading physicians as an "historic development in medical communications." It is expected greatly to encourage the communication of new medical knowledge and clinical research via the medium of medical exhibits.

For the first time, the most outstanding scientific exhibits at major annual medical conventions are being preserved on film strip.

Every medical college will have its own "library" of film strips. Faculty members and students will be able to study these outstanding exhibits, which have not been seen in the past by those unable to attend such conventions as that of the American Medical Association. Moreover, those engaged in medical research at medical colleges may in this way obtain ideas for the design of their own exhibits for other conventions.

The project is supported by Lakeside Laboratories, Inc., Milwaukee, Wisconsin, which has established Exhibits-On-Film, a library. A staff of medical journalists and photographers have started to attend major medical meetings, including the two annual sessions of the American Medical Association and those of other national organizations. With the cooperation of these groups and the selected physicians who exhibit their research work, the exhibits are being recorded on film with close-ups of the important sections. A narration is recorded wherein the physician-exhibitor's work is explained.

MEND News

On March 19-28, 34 representatives of MEND-affiliated medical colleges participated in the 1958 MEND Orientation Tour. Included in this group were Deans Donald G. Anderson (Rochester), Coy C. Carpenter (Bowman Gray), Mark R. Everett (Oklahoma), F. G. Gillick (Creighton), Robert S. Jason (Howard), Marcus D. Kogel (Albert Einstein), Homer F. Marsh (Miami), and Richard H. Young (Northwestern), as well as 13 MEND Coordinators, other faculty members, Federal agency representatives, and MEND Program personnel.

The Tour began in San Diego, California, where Naval installations were visited, including the U. S. Naval Hospital, the Marine Recruit Depot, the Naval Electronics Laboratory, Naval Air Stations at Mirimar and North Island, Eleventh Naval District Headquarters, the submarine *U.S.S. Spinax*, and the aircraft carrier *U.S.S. Bennington*. Tour participants were afforded an extensive opportunity to observe and discuss medical and operational aspects of the various installations and vessels.

Following the visit to Navy activities, the Tour moved to San Antonio, Texas, on March 23, and spent the following week in viewing Air Force and Army facilities in this area. Air Force activities observed included the Lackland Air Force Hospital, the

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Lackland AFB recruit processing facilities, and the School of Aviation Medicine at Randolph AFB. Army organizations included Brooke Army Hospital, the Army Medical Service School, the Medical Training Center, the Surgical Research Unit, and field training at Camp Bullis, Texas. Tour participants also had the opportunity, while visiting the Brooke Army Medical Center, of observing research in mouth-to-mouth breathing as compared with resuscitative methods presently in use.

Apart from the Orientation Tour, other MEND activities for March included a 3-day symposium on "Management of Mass Casualties," conducted at the Walter Reed Army Institute of Research on March 3-5. Sixty-four representatives from 39 medical colleges attended this program.

During March 24-29, 5 MEND-school faculty members attended the regular 5½-day course in "Management of Mass Casualties" at WRAIR.

On Friday, March 21, Tulane University sponsored, under MEND auspices, a field trial of the repacked FCDA 200-bed emergency hospital. Attended by representatives of MEND-affiliated medical colleges, and civil defense agencies, the trial was designed to test the hospital unit under conditions of local disaster.

Helen Hay Whitney Foundation

The Helen Hay Whitney Foundation announced the availability of a limited number of annual fellowships for individuals up to the age of 35, holding the M.D. or Ph.D. degree or equivalent. The awards will be made to individuals who wish to do investigative work or obtain further research training in the connective tissue field.

News from the Medical Schools

Georgetown

The Very Reverend Edward B. Bunn, S. J., president of Georgetown University has announced the appointment of Dr. HUGH H. HUSSEY as dean of the medical school, effective July 1. Dr. Hussey is presently professor and director of the department of medicine and will succeed Dr. FRANCIS M. FORSTER, who is resigning the post to devote all his time to his specialty. Dr. Forster will remain at Georgetown as professor and director of the department of neurology, a position he has held along with the deanship.

Hugh H. Hussey, M.D.

Dr. Hussey has been on the faculty since 1936. In 1951 he became editor of *GP*, after having been associate editor of *Medical Annals of the District of Columbia*.

Colorado

A $17,250,000 long-range building program for the University of Colorado Medical Center's Denver campus was approved by the Board of Trustees. The proposed construction will embrace two major phases, a new

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By JOHN B. MIALE, M.D., Professor of Pathology, University of Miami School of Medicine; Director of Clinical Pathology, Jackson Memorial Hospital, Miami, Florida. Just Published. 735 pages, 6¼" x 9¼", 192 illustrations, 9 plates including 5 in color. Price, $18.75.

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By EDWIN F. PATTON, M.D., Former Associate Medical Director of the American Child Health Association in New York; Former Assistant Professor of Pediatrics, College of Medical Evangelists, Los Angeles, California. Just Published. 454 pages, 6¼" x 10". Price, $13.50.

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hospital, clinical research building and out-patient department north of the present campus on the golf course site, and some new construction and considerable remodeling at the present location south of Ninth Avenue.

Dr. GASTON E. BLOM, formerly of Boston, has been appointed director of the Children's Division of the Psychiatric Clinic.

Harvard

Associate Justice Felix Frankfurter of the United States Supreme Court delivered the 22nd Gay Lecture Upon Medical Ethics at the Harvard Medical School, Friday, March 21. Mr. Frankfurter discussed "A Lawyer's *Dicta* on Doctors."

Jefferson

Dr. ANDREW J. RAMSAY has been appointed professor and head of the department of anatomy and director of the Daniel Baugh Institute of Anatomy. Dr. Ramsay succeeds the late Dr. George A. Bennett, who, in addition to serving as Dean, had also continued as head of the department of anatomy and director of the Institute. Dr. Ramsay has served on the faculty since 1936 and has been professor of histology and embryology since 1948.

North Carolina

The name of the History Club of the University of North Carolina School of Medicine has been changed to honor a veteran medical educator. At a recent meeting of the club, it was voted to adopt the name of the James B. Bullitt History Club. Dr. Bullitt is professor emeritus of pathology. He retired from active teaching in 1947. The club was founded five years ago. Dr. WARNER WELLS and Dr. CHARLES W. HOOKER are the faculty sponsors of the organization.

Oklahoma

Dr. WILLIAM ROBERT RICHARDSON has been appointed professor of pediatric surgery in the department of surgery. He arrived on the campus on April 15. Dr. Richardson was formerly on the staff of the Downstate Medical Center of the State University of New York, Brooklyn.

Stanford

Announcement has been made by university officials that the final 21 contracts to complete first-stage construction of the Stanford Medical Center have been awarded to bidders. The awards total approximately $6 million. Work on some contracts is already under way. First-stage buildings are to be ready for students by the fall of 1959. Construction covered by the new contracts includes a clinic building, a library and sciences building, and a classroom and laboratory building. Other work involved is completion of the top floor interior of the Rehabilitation Building.

S.U.N.Y. (Brooklyn)

Dr. ROBERT A. MOORE was formally inaugurated as the first president of the State University of New York Downstate Medical Center on May 2. The ceremony took place under a marquee behind the Center's Basic Sciences Building at 450 Clarkson Avenue, Brooklyn. Deans of medical schools, presidents of other State University of New York colleges, and presidents of other universities and scientific organizations marched in the processional along with the Regents of the State of New York, Trustees of the State University and faculty of the Medical Center.

Announcement has been made of a new program to train researchers in psychiatry. The program leads to the degree of Doctor of Medical Science and is open to M.D.'s who have completed three years of residency training in psychiatry. It will go into effect in September, 1958.

Long-awaited new edition of a medical classic . . .

Adams: PHYSICAL DIAGNOSIS

14th edition

Physical Diagnosis is in a new edition, the first since 1942. It will be welcomed by its old friends, who knew it as *Cabot & Adams*, and is certain to make many new ones. Adams draws on the combined knowlege and experience of the Massachusetts General Hospital in presenting the best in modern physical diagnostic techniques, including radiologic and electrocardiographic procedures. But there is more than diagnosis here: the book is a veritable compendium of medicine, emphasizing the commoner disturbances. It shows how the patient should be examined, describes normal findings, and explains the important signs and symptoms created by injury or disease. Many fresh photographs and helpful line drawings help make the presentations particularly clear.

Contents: History. Physical Examination. Body as a Whole. Head. Neck. Shoulder Girdle and Upper Extremities. Breasts, Axillae, and Back. Inspection of Thorax. Palpation of Thorax. Pulse. Blood Pressure. Percussion of Thorax. Auscultation of Lungs and Heart. Electrocardiogram. Cardiac Dilatation and Hypertrophy. Congestive Failure. Inadequate Cardiac Output. Classification of Cardiovascular Disease. Congenital Cardiovascular Disease. Rheumatic Heart Disease. Syphilitic Cardiovascular Disease. Heart Disease in Relation to Other Infections. Hypertensive Heart Disease. Coronary Heart Disease. Disturbances of Cardiac Rhythm. Miscellaneous Cardiovascular Disorders. Pericarditis.

Diseases of the Trachea and Bronchi. Pneumonia. Pulmonary Tuberculosis. Miscellaneous Lung Diseases. Diseases of Pleura. Abdomen. Esophagus, Stomach and Intestines. Liver, Gallbladder, Pancreas and Spleen. Urinary Tract. Adrenal Glands. Anus, Rectum and Genital Organs. Pelvic Girdle and Lower Extremities. Joints. Nervous System. Diseases of Nervous System.

By F. DENNETTE ADAMS, *M.D., Physician, Board of Consultation, Massachusetts General Hospital; Consultant to The Surgeon General, U. S. Army; Consultant to Boston and Bedford, Mass. Veterans Administration Hospitals.*

850 pp., 428 figs. (1958) • *$12.00*

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Temple

The election of WYNNE SHARPLES, M.D., and RICHARD KERN, M.D. to the Temple University Board of Trustees was announced in February by President Robert L. Johnson. Both physicians will serve on the Committee on Hospital affairs.

Tulane

A memorial service honoring Dr. RUDOLPH MATAS and the seventh presentation of the Rudolph Matas Award in Vascular Surgery will be held Friday, May 9, in the Hutchinson Memorial Building of the medical school. Dr. Matas, who died September 23, 1957, at the age of 97 years, served Tulane's department of surgery all of his adult life, becoming professor and head of the department in 1894.

Virginia

Dr. IAN STEVENSON, chairman of the department of neurology and psychiatry, has announced the formation of a new division within the department, to be known as the division of behavioral science.

Dr. ARTHUR JULIAN BACHRACH, associate professor of neurology and psychiatry and currently director of the division of clinical psychology, has been named to head the new unit, which will have as its major function the advancement of research and teaching in the areas of psychology, sociology and anthropology particularly as they relate to the teaching of medical students. The present division of clinical psychology will become a section of the new division.

Wisconsin

The University of Wisconsin Medical School is completing plans for the Second Conference on Medical Education for Foreign Scholars in the Medical Sciences.

Slated for June 30, July 1 and 2 on the University of Wisconsin campus, the program provides for group discussion sessions after the formal presentation of each paper. A chairman and two resource persons will head these discussions.

The philosophy of higher education in the United States, objectives of medical education, the medical student and teacher, and education after medical school are some of the topics to be discussed at this year's conference.

Yale

Dr. WAYNE O. SOUTHWICK, a member of the Johns Hopkins medical faculty, has been appointed associate professor of orthopedic surgery and chief of the section in orthopedics. He will assume his new duties at Yale in July.

Correction

Dr. Arne Gosta Johannes Rhodin was incorrectly reported as having joined the faculty of the New York Medical College. Dr. Rhodin has joined the department of anatomy in the New York University College of Medicine.

The Personnel Exchange

Faculty Vacancies

PROFESSOR OF PATHOLOGY★IRAN

Applications are invited for the Chair of Pathology, University of Shiraz, Shiraz, Iran. Contract basis for 2-4 years. $5,000 will be sent to home address in 12 months. A monthly salary of 25,000 rials will be paid (enough for himself and family to live comfortably in Shiraz). Air tickets will be provided for himself and family. Position should be filled by October 1958. Contract terms and information available by writing to: Dr. Zabih Ghorban, Chancellor of the University, Shiraz, Iran.

• PRINCIPAL SCIENTIST: Ph.D. in biochemistry for fully equipped radioisotope laboratory in 1000 bed hospital affiliated with medical college. Major function to develop research program. To be advisor for other biochemical research involving radioisotopes, and to supervise laboratory and personnel. Will have faculty appointment. Salary $7,405-10,065. Address replies to: Radioisotope Service, Veterans Administration Hospital, Albany, N. Y.

• ANATOMIST: Assistant professor or instructor for medical and dental school teaching, prefer experience in teaching gross anatomy. Address: V-66.

• CARDIOVASCULAR PHYSIOLOGIST: A new faculty position in physiology has been created at the University of South Dakota by a long-term grant from the South Dakota Heart Association. The holder is to devote at least ¾ time to basic research in the general area of cardiovascular physiology with less than ¼ time for teaching and other duties. Faculty rank is to be commensurate with training and experience. The salary range is from $5,000 to $10,000 annually. Direct inquiries to Medical Advisory Committee, Heart Association c/o Office of the Dean, University of South Dakota, School of Medicine, Vermillion, South Dakota.

• PHYSIOLOGIST, PHARMACOLOGIST or BIOCHEMIST: (Ph.D. or M.D.) required to direct newly established Anaesthesia Research Laboratory. Some teaching assignments to undergraduate and post-graduate students. Salary depending upon experience. For full particulars write Gordon M. Wyant, F.F.A.R.C.S., Professor of Anaesthesia, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.

• VIRUS RESEARCH: M.D., or Ph.D. interested in infectious diseases, basic studies on mechanisms of infection and on etiology, pathogenesis and epidemiology of virus diseases of infancy and childhood. Excellent facilities. Salary and rank open on basis of candidate's qualifications. Starts July 1, 1958. Address: V-67.

• BACTERIOLOGY: Associate Professor and Senior Assistant Bacteriologist, Provincial Laboratory and University Hospital (combined appointment). M.D. with experience of teaching and of medical diagnostic bacteriology. Initial salary $10,000. Apply to the Dean, Faculty of Medicine, the University, Edmonton, Alberta, Canada.

• MEDICAL BACTERIOLOGIST: The University of Ottawa requires an Assistant—Professor of Bacteriology in the Faculty of Medicine. Applicant should be a graduate in medicine with postgraduate experience in bacteriology preferably in teaching or laboratory instruction. Salary open. Please state salary expected. Address inquiries to Dr. R. J. Gibbons, Professor of Bacteriology, Faculty of Medicine, University of Ottawa, Ottawa, Canada.

• PHYSICIANS (2): The Survey of General Practice in Canada requires two physicians as full-time assistants, one in Nova Scotia, the other in western Canada. Duties commence summer or autumn of 1958 and run 12 to 18 months (details to be arranged). Salary $8,000-$10,000 per annum, depending on experience, plus travel expenses. These positions involve considerable responsibility and should appeal to physicians who have a broad interest in the problems of general practice, including the educational problems. Applicants should have had two years' postgraduate training. Training in internal medicine is a desirable background. Send application, with details of experience and names of two references on medical faculties to Director, Survey of General Practice, School of Hygiene, University of Toronto, Toronto 5, Ontario.

• BIOCHEMIST: Applications are invited for the Chair of Biochemistry in the Faculty of Medicine. Minimum qualifications: M.D. with special training in Biochemistry, or Ph.D. in Biochemistry. Teaching and research experience essential. Salary in the range of $10,000, depending on qualifications and experience. Address applications or enquiries to L. G. Bell, M.D., Dean, Faculty of Medicine, The University of Manitoba, Emily & Bannatyne, Winnipeg 3, Man., Canada.

To aid in solution of the problem of faculty vacancies, MEDICAL EDUCATION will list persons and positions available, as a free service. The school department or person may have the option of being identified in these columns or of being assigned a key number for each position listed. Mail addressed to key numbers will be forwarded to the person or department listing the request.

Information for these columns should reach the Personnel Exchange, Journal of Medical Education, 2530 Ridge Avenue, Evanston, Illinois, not later than the 10th of the month which precedes the month in which the listings will appear.

Personnel Available

• PHYSIOLOGIST: Male, 36. Eight years experience in teaching and research in medical school. Present position, assistant professor of physiology. Primary research interests: mammalian respiration, neurochemistry. Desires position in teaching and research. Address: A-334.

• PHARMACOLOGIST - TOXICOLOGIST: Age 35, strong cardiovascular and biochemical background; good experience and recommendations. Desires hard work challenging position with commensurate remuneration and future. Will attend Federation meetings. Address: A-335.

• MICROBIOLOGIST: Ph.D., qualified in microbial physiology and genetics, biochemistry, and medical bacteriology; seeks faculty or full-time research position. Address A-336.

• ENDOCRINE PHYSIOLOGIST: Ph.D., age 35. Presently assistant professor of physiology engaged in graduate and undergraduate teaching and research in endocrinology, cell physiology, and animal physiology. Formerly research associate in physiological chemistry. Publication. Desires to relocate. Academic or full-time research. Address: A-337.

• PHYSIOLOGIST: Age 30, male. To receive Ph.D. in June of 1958. Have had teaching experience in medical school. Currently assistant instructor in department of physiology and pharmacology. Ph.D. work on glycogen fractions of myocardium. Address: A-338.

• PHYSIOLOGIST: Ph.D., 35; Four years experience medical school teaching, 5 years research experience, 21 publications on carbohydrate and fat metabolism. Present rank assistant professor. Desires academic appointment with research opportunities. Address: A-339.

• BIOLOGIST-ANATOMIST: Ph.D., male. Teaching and research experience in anatomical and physiological sciences. Have taught microscopic anatomy and physiology. Research publications. Wishes teaching and research position in another region of the country. Address: A-340.

• ANATOMIST: Ph.D., male. At present assistant professor of anatomy. Six years experience. Have taught complete courses in Gross Anatomy, Embryology, and Neuroanatomy. Published textbooks and research. Desires relocation to another section of the country. Address A-341.

• PHYSIOLOGIST: Ph.D. Assistant professor in medical school wishes to relocate. Primary interest is in endocrinology. Wish for a position with teaching and research facilities. Grants may be transferred. Address: A-342.

• HEMATOLOGIST-INTERNIST: Age 33. Board eligible. Broad clinical, research, teaching experience in hematology, radioisotope. Will consider any challenging position. Available immediately. Address: A-343.

• GASTROENTEROLOGIST: Age 32. Board certified, with four years full-time experience in gastroenterology, primarily in university hospital. Research experience and publications; membership in Am. Fed. Clin. Research, Am. Gastroscopic Society. At present assistant professor; seeking better opportunity for research and teaching, will consider geographical full-time, preferably Northeast or South. Address: A-344.

• INTERNIST: (Also two years of Psychiatry) Age 46, with experience in teaching and research (clinical investigation, normal and pathological physiology, experimental pharmacology and preventive medicine). Many publications, at present in group practice in Canada. Desires to return to academic position in research field. Address: A-345.

• PHARMACOLOGIST: Ph.D., age 33. Six years industrial research and 2 years teaching experience. Background of research in endocrinology and drugs effecting the hematopoietic system. Prefers teaching position in a medical institution allowing adequate time for research. Available June 15, 1958. Address: A-346.

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• PATHOLOGIST: Foreign trained. U. S. citizen. After working in a general hospital for 7 years, desires research position. Particularly interested in pathology of chronic infectious disease. Publications, including an extensive investigation of influence of tobacco smoke on cardio-vascular system. Teaching experience but prefers a full-time research position. Address: A-347.

• PEDIATRIC ALLERGIST: Age 30, Dipl. Amer. Board of Pediatrics. Currently fellow in pediatric allergy, seeking full or part-time teaching position in either Illinois or New York, as of July, 1958. Address: A-348.

• MEDICAL BACTERIOLOGIST: Ph.D. Excellent background in clinical bacteriology, mycology, and public health bacteriology. Good background in parasitology and virology. Ten years teaching experience. Research published and in progress. Admin. experience in hospitals. Desires position in teaching and/or research and/or clinical microbiology. Address: A-349.

• PATHOLOGIST: Age 32, board certified PA, traditionally trained and of semi-academic background, seeks full-time academic position with opportunity for combined teaching, service-type practice in university hospital. Especial interests in medical and pediatric pathology. South or southwest preferred. Address: A-350.

• INTERNIST: Physician from Colombia, S.A. Professor of Internal Medicine of the Faculty of Bogota in 1953, assistant professor since 1939. Member of Academy of Medicine of Bogota. Publications: 3 books and many articles in Spanish. Fluent in English. Last five years Cultural Counselor of the Embassy of Colombia in Washington, D.C. Recent courses in Cardiology and radioisotopes at Georgetown Univ. Interested in teaching in American university. Address: A-351.

• PHARMACOLOGIST-TOXICOLOGIST: Ph.D., age 35. Married, 2 children. Assistant Professor of Pharmacology and Toxicology with approximately 10 years pre-clinical teaching experience in medical school and with position of Scientist in associated medical research facility. Present research in field of inhalation materials and involves radioisotopic and telmetering technics. Desires position in non-industrial institution where fundamental research is emphasized and teaching opportunities exist. Particularly interested in autonomic physiology-pharmacology of the respiratory tract. Address: A-352.

• PREVENTIVE MEDICINE: British, married with one child. Medical graduate of Edinburgh University, 1952. Served two years National Service as Captain in Royal Army Medical Corps—M.O. in charge Chest Investigation Unit at Army Hospital. Several internships in medicine, surgery and experience in general practice. Post-graduate year, for D.P.H. in Edinburgh University. Presently on staff of Usher Institute of Public Health and Social Medicine, Univ. of Edinburgh with teaching and research duties. Author and co-author of articles in medical journals. Desires appointment in American university in Public Health (Preventive Medicine). Address: A-353.

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in the

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Medical college teachers and administrators, and other persons interested in medical education now have the opportunity to become Individual Members of the Association of American Medical Colleges.

Individual Membership means receiving the Journal of Medical Education each month. It means participating in the discussions of the Annual Meeting and receiving the reports of the Teaching Institutes. It means receiving copies of the yearly *Directory*, the *Proceedings* of the Annual Meeting, and other Association publications. And it makes available a valuable, though limited, information service and a personnel exchange service.

Individual Membership, at only $10 a year, is open to any person who has demonstrated a serious interest in medical education over a period of years. All the privileges of membership and a provisional membership card are granted immediately after payment of the $10 fee, although confirmation must await official action at the next Annual Meeting.

To obtain membership, fill out the application form below, append check for $10, and return to the Association's central office at 2530 Ridge Ave., Evanston, Ill.

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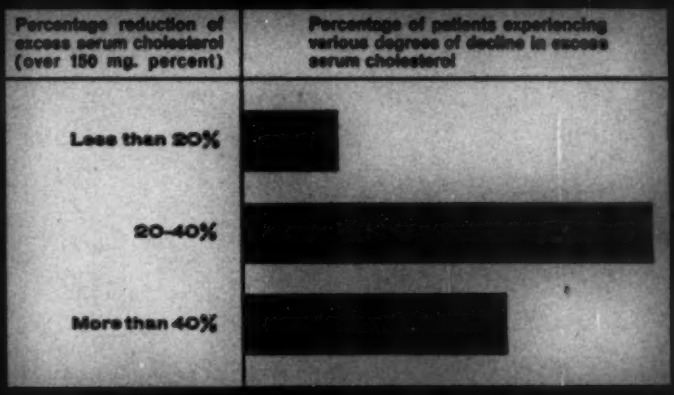
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